

Report of the

42d NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1957



U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
MISCELLANEOUS PUBLICATION 222

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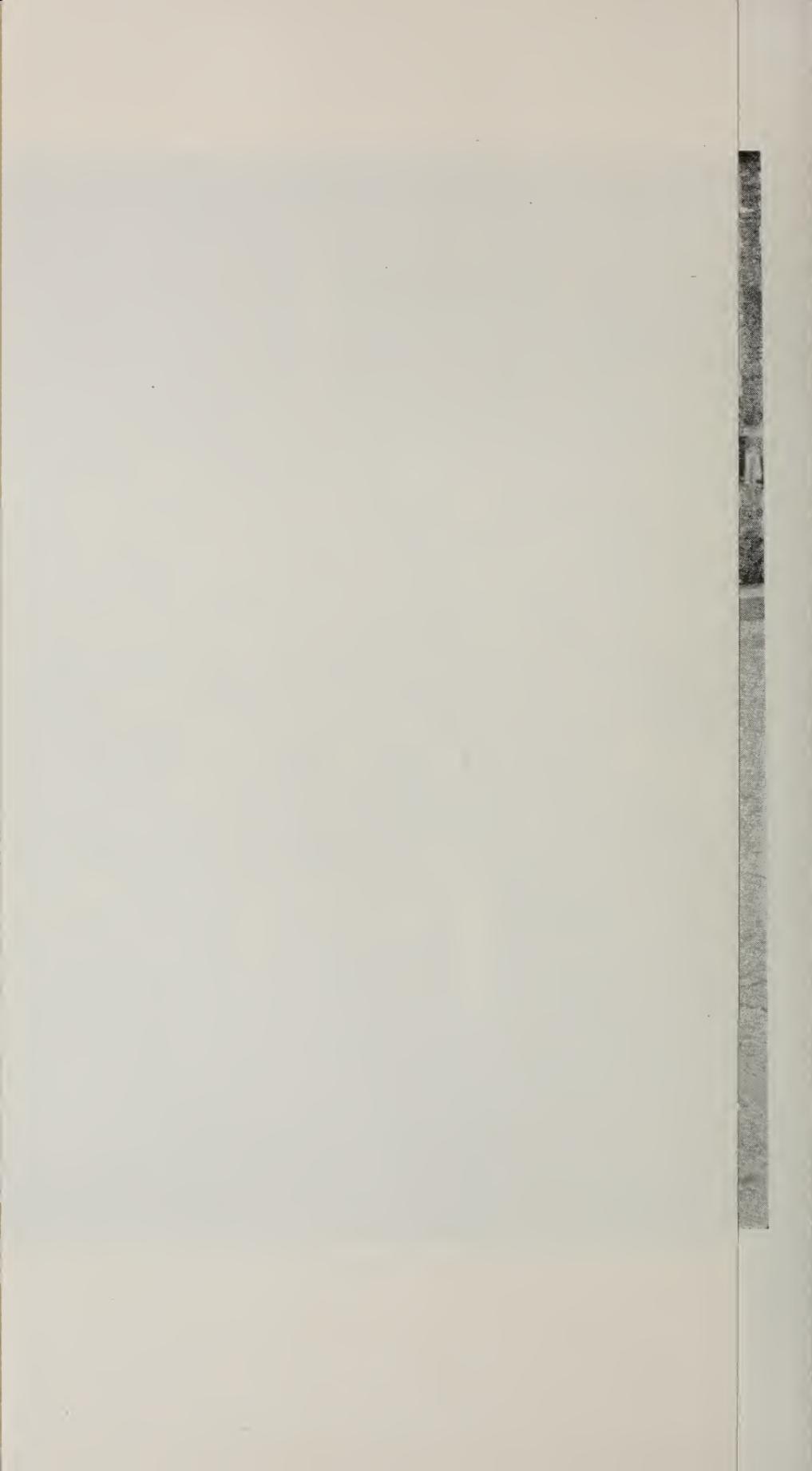
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Report of the 42d National Conference on Weights and Measures 1957

Attended by Representatives from Various States

Sponsored by the National Bureau of Standards

Washington, D. C., June 3, 4, 5, 6, 7, 1957



United States Department of Commerce • Sinclair Weeks, Secretary

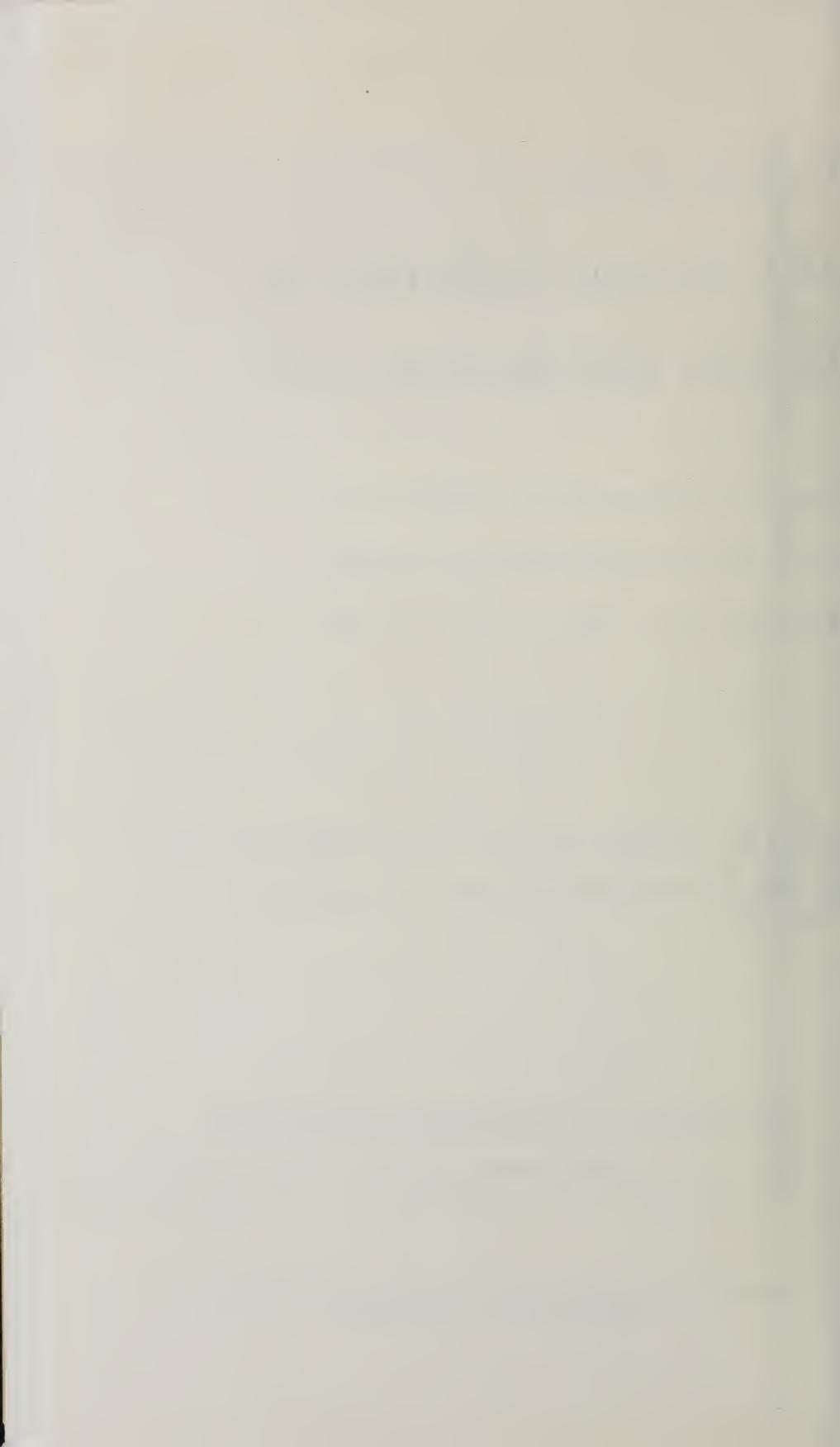
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National Bureau of Standards Miscellaneous Publication 222

Issued December 20, 1957



Official photograph of delegates and guests attending the Forty-second National Conference on Weights and Measures, assembled on the grounds of the headquarters hotel.



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OFFICERS AND COMMITTEES

OFFICERS

(As elected by the Forty-first National Conference to serve during the Forty-second National Conference)

President: A. V. ASTIN, Director, National Bureau of Standards.

Vice Presidents:

J. C. GOLL, Chief Inspector, Weights and Measures Department, Public Service Commission, State of North Dakota.

J. E. MAHONEY, Superintendent of Weights and Measures, Department of Markets, State of Maryland.

A. J. MAYER, Director, Division of Weights and Measures, Department of Agriculture and Immigration, State of Louisiana.

M. A. NELSON, Chief, Bureau of Foods and Standards, Department of Agriculture, State of Michigan.

R. K. SLOUGH, Sealer of Weights and Measures, Akron, Ohio.

C. J. WILLS, JR., Sealer of Weights and Measures, Portland, Maine.

Secretary: W. S. BUSSEY, Chief, Office of Weights and Measures, National Bureau of Standards.

Treasurer: G. F. AUSTIN, JR., Deputy Sealer of Weights and Measures, Detroit, Michigan.

Chaplain: R. W. SEARLES, Deputy Sealer of Weights and Measures, Medina County, Ohio.

Sergeant at Arms: F. J. DELANEY, Inspector of Weights and Measures, Food and Drug Commission, State of Connecticut.

(*Ex officio* and as elected by the Forty-second National Conference for the ensuing year)

President: A. V. ASTIN, Director, National Bureau of Standards.

Secretary: W. S. BUSSEY, Chief, Office of Weights and Measures, National Bureau of Standards.

Chairman: J. P. McBRIDE, Director of Standards, State of Massachusetts.

Vice Chairmen:

C. D. BAUCOM, Superintendent, Weights and Measures Division, Department of Agriculture, State of North Carolina.

S. H. CHRISTIE, JR., Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, State of New Jersey.

H. J. McDADE, Sealer of Weights and Measures, San Diego County, California.

R. W. SEARLES, Deputy Sealer of Weights and Measures, Medina County, Ohio.

Treasurer: C. C. MORGAN, City Sealer of Weights and Measures, Gary, Indiana.

Chaplain: J. H. MEEK, Director, Division of Markets, Department of Agriculture, State of Virginia.

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(As elected by the Forty-second National Conference)

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S. H. CHRISTIE, JR.
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J. H. MEEK

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T. C. HARRIS, JR., of Virginia.
J. J. LEONARD, of New York.
RALPH MAGOFFIN, of South Carolina.
V. D. ROGERS, of Memphis, Tennessee.
W. M. SAXTON, of Lansing, Michigan.
CLYDE SPRY, of Iowa.
N. P. TILLEMAN, of Green Bay, Wisconsin.
E. C. WESTWOOD, of Salt Lake City, Utah.

STANDING COMMITTEES

(As constituted at the conclusion of the Forty-second National Conference, the personnel and organization of each of the standing committees of the Conference are as listed. As reported, the membership of each committee reflects the appointments made by the President of the Conference, to fill vacancies that have occurred from expiration of term or other cause, and the elections by the several committees of chairmen for the ensuing year. The remaining term of office for each committee member, in years, is shown by the figure in parentheses following each entry.)

(In conformance with the personal desire of Mr. M. W. Jensen of the National Bureau of Standards to place in immediate operation the principle expressed in the new Organization and Procedure of the Conference, that only active members be hereafter "appointed" to membership on standing committees, he tendered his resignation as a member of the Committee on Specifications and Tolerances. The President of the Conference appointed Mr. C. O. Cottom of Michigan to fill the unexpired term of 3 years.)

COMMITTEE ON EDUCATION*

W. A. KERLIN, of Alameda County, California, Chairman. (5)
C. A. LYON, of New Hampshire. (1)
J. E. MAHONEY, of Maryland. (2)
I. M. LEVY, of Chicago, Illinois. (3)
T. C. HARRIS, Jr., of Virginia. (4)

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NALLS BERRYMAN, of Florida. (1)
J. T. KENNEDY, of the District of Columbia. (3)
G. L. JOHNSON, of Kentucky. (4)
ROBERT WILLIAMS, of Nassau County, New York. (5)

COMMITTEE ON SPECIFICATIONS AND TOLERANCES*

J. E. BRENTON, of California, Chairman. (2)
H. E. HOWARD, of Miami, Florida. (1)
C. O. COTTOM, of Michigan. (3)
D. M. TURNBULL, of Seattle, Washington. (4)
C. L. JACKSON, of Wisconsin. (5)

*W. S. Bussey, Secretary of the Conference, is *ex officio* nonvoting Secretary to the Committee.

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NATIONAL CONFERENCE**

Committee on Nominations: V. D. CAMPBELL, of Ohio, Chairman ; J. A. BERNARD, of St. Louis, Missouri ; F. M. GREENE, of Connecticut ; G. L. JOHNSON, of Kentucky ; C. C. MORGAN, of Gary, Indiana ; J. F. TRUE, of Kansas ; L. E. WITT, of Milwaukee, Wisconsin.

Committee on Resolutions: H. M. TURRELL, of Pennsylvania, Chairman ; T. C. BECK, of Oklahoma ; J. M. DIETZ, of Union County, New Jersey ; H. N. DUFF, of Colorado ; M. M. EMERICK, of Illinois ; J. G. GUSTAFSON, of Minneapolis, Minnesota ; J. D. WALTON, of Dallas, Texas.

Ladies Hospitality Committee: MRS. W. S. BUSSEY, MRS. J. M. DIETZ, MRS. C. M. FULLER, MRS. M. W. JENSEN, MRS. R. E. MEEK, MRS. R. D. THOMPSON, MRS. H. F. WOLLIN.

IN CHARGE OF REGISTRATIONS

MRS. F. C. BELL, MRS. E. L. BRUECKNER, MRS. K. R. SPRY, MRS. K. M. SCHWARZ.

OFFICIAL REPORTER

MRS. F. T. ACHENBACH.

COMMITTEE MEETINGS, MONDAY, JUNE 3, 1957

Monday was set aside for meetings, both open and executive, of the Conference committees. However, as a result of the many requests for time before the Committee on Specifications and Tolerances, it was found necessary to schedule hearings on some specific items before the committee for Sunday, June 2, 1957. Announcements of the meetings on Monday, June 3, were carried in all invitations, all pre-Conference publicity, and in the tentative and printed programs. A special announcement concerning the meeting of the Specifications and Tolerances Committee on Sunday, June 2, was also sent out.

A large number of delegates took advantage of the committee meetings, and, as a result, attendance and participation were exceptionally good.

The Conference committees that met on Monday, June 3, were the Study Committee on Conference Organization, Committee on Laws and Regulations, Committee on Specifications and Tolerances, and Committee on Education.

REPORT OF THE FORTY-SECOND NATIONAL CONFERENCE ON WEIGHTS AND MEASURES¹

FIRST SESSION—MORNING OF TUESDAY, JUNE 4, 1957

(A. V. ASTIN, PRESIDENT, AND M. A. NELSON, VICE PRESIDENT, PRESIDING)

The invocation was delivered and the memorial service for departed members was conducted by the Conference Chaplain, Rev. R. W. Searles, Deputy County Sealer of Weights and Measures, Medina County, Ohio.

ADDRESS BY HON. WALTER WILLIAMS, UNDER SECRETARY OF COMMERCE

(Mr. Williams spoke extemporaneously. He welcomed the delegates to Washington on behalf of the U. S. Department of Commerce, described the concern of the Government with the shortage of scientists and engineers, urged the delegates to suggest science as a career to youngsters in their respective jurisdictions, told of the efforts of the National Bureau of Standards to promote interest in science, and discussed the Federal budget.)

REPORT OF THE PRESIDENT

By A. V. ASTIN, *Director, National Bureau of Standards*

This Conference activity, now at its forty-second meeting, is one of the most important activities in which the National Bureau of Standards has the opportunity of participating. As you know, the Constitution assigns to the Congress the authority to fix the standards of weights and measures. The Congress has, in turn, assigned this responsibility to the National Bureau of Standards in the words of "developing and maintaining the standards of physical measurement, together with provision and means for their effective utilization." We consider the standards for physical measurement as very essential things in 3 important types of interchange. First is the interchange in commerce which you people are directly associated with where standards of measurement are essential before agreement as to value or quantity can be reached prior to exchange.

The next area is in the field of science and technology where the standards provide the meaning to the numbers in which the results of the measurements of science and technology are expressed. Exchange of information among scientists is essential to the progress of science, and exchange of their information with the technologists is

¹ With the exception of formal papers and committee reports, the record of the 42d National Conference on Weights and Measures has been rearranged, consolidated, and condensed wherever necessary to reduce it to essentials for future reference.

essential in order for new industries to be built upon the findings of science.

The third area is in the industry itself, where standards are necessary in order to have interchangeable components. An interchangeable component is at the basis of our modern technological economy. Thus, the standards provide for interchange in these 3 areas: Commerce, science, and industry.

In the commerce area we have a chance to participate through our relationship with the members of the National Conference on Weights and Measures. As you know, the Federal Government exercises no regulatory power in connection with the enforcing of weights and measures laws. This is left to the States. However, the Congress has assigned the responsibility to the National Bureau of Standards of promoting uniformity in weights and measures administration and methods of inspection among the States, counties, and cities. This Conference is, of course, one of the most effective means we have of implementing that responsibility. With the growing complexity of the technology and commerce and the number of different types of things that have to be measured, the responsibilities of the Conference, I think, are increasing in range and complexity year by year.

Because of this, it was my feeling that this Conference, although it has accomplished a great deal since the first meeting in 1905, is going to have greater and more difficult responsibilities in the years to come. We have gotten by in, roughly, the first 50 years we have been operating, with a very loose definition of operating procedures for the Conference and a very loose definition of the responsibility of the National Bureau of Standards for this Conference. It is my feeling that these loose procedures and this lax definition of the relationship and responsibility of the National Bureau of Standards to the Conference have to be clarified. In order to promote this clarification, I named a committee consisting of representatives from the delegates of the Conference, as well as representatives from industry groups concerned with the Conference, to make recommendations to this Conference concerning the operating procedures and the relationships of the Conference to the National Bureau of Standards. That committee has been chaired by Mr. Rollin Meek of Indiana, and other members included Mr. McBride, Mr. Kerlin, Mr. Crawford, Mr. Fakler, Mr. Moss, and Mr. Sanders. We tried to get as wide a representation in this committee as possible. We spread it around geographically. We included State official representation, county official representation, and city official representation, as well as a variety of interests from industrial units concerned. The committee has completed its studies. There was a final meeting, I understand, yesterday. They had advertised, earlier, some tentative proposals. Their recommendations will be presented to you this afternoon for your consideration and, I trust, adoption.

Now, one of the essential ingredients of any standards program, which is going to be effective in commerce and science, is its international aspects. That is, the standard for measurement that we use in this country must have a reliable meaning when used or applied in other nations of the world. Therefore, it is essential that the standards we use be used in other nations of the world if we are to have international commerce and international science. To carry out this particular activity, the Treaty of the Meter was approved by many of

the leading countries of the world in 1875, and, as a result of this, an International Bureau of Weights and Measures was set up in Paris, France. This Bureau has custody of the basic standards for measurement, the meter and the kilogram, and in addition is concerned with the standards for electrical, chemical, and optical measurements, as well as others. This Bureau and the committee that operates it provide the means for having standards realizable on an international basis. The International Bureau is governed by a General Conference on Weights and Measures which meets, roughly, once every 6 years, and all of the adherents to the Treaty of the Meter send delegates to this conference. The last General Conference took place in 1954, and the next one will be in 1960.

During the period between the conferences, an International Committee of Weights and Measures governs, consisting of individuals from different nations. I have the honor to serve as a member from the United States. This committee met last fall in Paris and undertook a number of important actions which I think would be of interest to this group. First of all, it adopted a new definition of the second. This is important in commercial ventures with which most of you are concerned. Nonetheless, everybody thinks of a second as a fraction of the average day. This has turned out to be a nonprecise definition because the days vary. For this reason, variations in the second on the order of 1 part in 50 million were encountered, which led to difficulty.

Acting upon the recommendation of the Astronomical Union, the committee adopted last fall, as a new definition of the second, a precise fraction of the astronomical year of 1900. This changes the definition from a fraction of a day to a fraction of a specific year. This cut out a great deal of the vagueness which had hitherto existed in the definition of the second. Nonetheless, the committee recognizes that this is only an interim solution of the problem. Ultimately, the ideal solution will be to define time in terms of atomic vibration. The committee set up an advisory group to arrive at an atomic definition of time. That special advisory committee is holding its first meeting in Paris this week.

At earlier meetings of the International Committee of Weights and Measures, the decision was weighed to abandon the definition of the meter and adopt as a length standard, light waves emitted from some specified atom. Progress reports were heard on this activity at the meeting last fall. There are a number of opportunities by which one can achieve this atomic definition for a length standard, and the committee was privileged to hear progress reports on it. In addition, the status of the accuracy of our electrical standard was considered.

You might be interested in knowing that last year we sent our prototype meter bar to the International Bureau for the third time since we first acquired this standard in about 1890. We are pleased to report that no discernible change in the length of this standard was observed, thus adding to our confidence in this length standard. In addition, we are pleased to report that the standard volt and ohm also show a high degree of accuracy.

You might be interested also in another international activity that reached sort of a culmination point last year. This is in connection with international approaches toward legal metrology, duplicating to some extent the sort of work this Conference undertakes. There

was started in 1930 an effort to form an organization for legal metrology, and Dr. Crittenden of the National Bureau of Standards was on the organizing committee for a number of years and I succeeded Dr. Crittenden for a short period after he passed away. There is now in existence an international organization for legal metrology that is seeking to develop measurement techniques in order to facilitate the international exchange of goods. The United States was invited to join this new organization. After careful consideration of this invitation by the State Department, the invitation was rejected for the following reasons: First of all, it appears to be the policy of our State Department to concentrate new international efforts in the United Nations and its affiliates. They look with disfavor on new international activity that might well be assumed by the United Nations. This is probably the major reason why the invitation was rejected, although the other one was also a very important one, namely, that there is no national body in the United States with responsibility for the legal metrology, the enforcement of weights and measures legislation. This responsibility is left to the States in this country, and, thus, there would be no suitable adhering body in the United States Government to affiliate with this international organization of legal metrology.

A suggestion was made that perhaps this Conference might have some sort of affiliation with the international organization of legal metrology. At the present time the charter or constitution and by-laws of the international organization does not provide for the adherence of private organizations in separate States, and, because of this, there is no real mechanism at the present time, as I see it, whereby this Conference could adhere to the international organization. Nonetheless, as work advances in this new organization, I am sure this Conference will be interested in it, and it may be that at some later day a mechanism can be developed for some sort of liaison activity.

Within the Bureau's internal program there have been a number of important developments during the past year. I would like to take time to tell you about these, but I am sure it would extend the program unduly. However, I would like to point out that we have made important advances in terms of meeting an industry requirement for developing and certifying gage blocks to an accuracy of one ten-millionth part of an inch. We still have a number of obstacles to overcome, but substantial progress has been made in meeting this industrial requirement.

In addition, we have developed new techniques for improving the accuracy of the electrical standards. We have developed new standards for measuring pressures going up to 150,000 and 200,000 pounds per square inch. We have improved our radio measurements and have resolved some of the discrepancies between these measurements as between our own national laboratory and those of other countries.

I would like to call to your attention one outstanding achievement in this program during the last year. We participated in one major advance in science, cooperating with scientists from Columbia University and the Institute for Advanced Studies at Princeton in providing experimental verification of the nonvalidity of the so-called "Law of Parity." This is a complex physical theorem, but it had been a basic theorem in physics. Physicists from our Low Temperature Laboratory were able to devise and carry out a most complex physi-

cal experiment that gave positive confirmation to theoretical conjectures of physicists at Columbia and the Institute for Advanced Studies. This is considered a most significant advance in physics. I am pleased to report that we played an important role in that activity.

Now, getting more specifically to the type of things you are interested in, namely, the activities of our Office of Weights and Measures and the work in our Metrology Sections, I am pleased to report that there have been substantial advances in the liquid-petroleum-gas measurement problem, and I understand you are scheduled to hear a presentation of that tomorrow and will also be invited to the demonstration of it when the Bureau is holding Open House for you tomorrow afternoon.

In addition, we have initiated a study of the status of standards in the United States. As you know, it has been many years since the standards which are in the custody of the States were given to them. We get an opportunity to examine some of them as they come in for calibration. This rather spasmodic examination we have given to these standards has led us to the conclusion that it would help a great deal in promoting accuracy and uniformity if new sets of State standards were supplied, together with some instruments and techniques for using them. The solution of this problem, if it is carried out this way, will be rather long and perhaps expensive, so we are approaching it very gradually. We have started out in a small way to examine the length standards in some of the New England States. Dr. Judson, the chief of our length-standards activity, has visited some 7 States and has come up with some tentative recommendations. In addition, we are concerned very much with the desires of the Conference members for additional training films and hope that at the Conference next year we can announce some definite additional contribution to this program.

Some time ago we were asked to aid Puerto Rico in surveying its weights and measures activity. Mr. Ralph W. Smith, a Consultant in the Office of Weights and Measures, made a visit there, and the Office subsequently made definite recommendations to the Government of Puerto Rico. I am very pleased to be advised that a number of these recommendations have been put into effect and that there has been substantial progress in the weights and measures program in Puerto Rico.

I mentioned earlier that you are invited to visit the National Bureau of Standards tomorrow. I would like to extend to all of you a cordial welcome to come out and go through our laboratories. At the same time I want to remind you again that we, at the National Bureau of Standards, consider that, as a Federal agency, we are set up to assist you in the promotion of more effective, more accurate, more reliable measurement technique. Our job is one of service. We aid the consumer and the average taxpayer, mainly through ways in which we can help you do your job better. Therefore, we invite you to present problems as you see them, to present them to us and ask for our help wherever you see an opportunity where we might be of assistance to you.

**ADDRESS BY HON. DANIEL J. CAREY, COMMISSIONER, DEPARTMENT OF
AGRICULTURE AND MARKETS, STATE OF NEW YORK, REPRESENTING
THE NATIONAL ASSOCIATION OF COMMISSIONERS, SECRETARIES,
AND DIRECTORS OF AGRICULTURE**

It is with a great deal of pleasure that I appear before your 42d Annual Conference of Weights and Measures Officials as the representative of the National Association of Commissioners, Secretaries, and Directors of Agriculture, at the request of Mr. Fitts, President of the Association. Mr. Fitts sent his regrets that he was unable to be present and discuss weights and measures with you.

I find that several of the States have overall supervision of weights and measures in the Department of Agriculture, but in many States the overall supervision is in other areas.

Some time ago, our Association discussed the possibility of setting up a committee to work with your National Conference and with the National Bureau of Standards on various problems, but since many of the States do not have the supervision in their Department of Agriculture, apparently it got sidetracked somewhere along the line. I, myself, would like to see that committee established to develop much more coordinated thinking on weights and measures activities between our Association and your organization. Most of what I have to say deals with my own experience in administering the program in New York State.

I am sure there are States that are probably doing a much better job than we are, and I would like to know how to correct some of the things that might need correction within our State. I will certainly try to get that committee established at our National Convention in Portsmouth, N. H., this fall so that the Association may work in coordination with some pertinent committee from your group.

It is interesting to note that the field of weights and measures keeps pace with the times. For example, it has produced devices that can automatically weigh and measure a commodity and then furnish a printed ticket showing commodity weights and per-pound prices with total computations. It is also in the process of developing electronic scales that can weigh heavy vehicles moving along highways at a rate of 35 miles per hour, and record the number of axles to the unit and the weight load on each axle. In this connection, a problem has arisen in New York State relative to the use of an electronic scale. Under our truck-mileage tax law, the State is failing to collect considerable money because there are not enough conventional scales and the truckmen seem to find a way to by-pass these scales when they are in operation. Also, the man-power necessary and the cost of operation of these conventional scales seems to limit the number of installations. The Tax Department and The Department of Public Works were anxious to install several of these electronic units, but our Weights and Measures Division did not have or seemed unable

to obtain sufficient data on which to certify these scales. We have, therefore, worked out an arrangement whereby an electronic scale will be installed in the vicinity of a conventional scale, and both readings recorded for a period of time. The thought in the use of the electronic scale was the installation of some 22 scales with about 4 portable recording units that could quickly be moved from one location to the other.

It is an intriguing fact that, despite such modern developments, the simple lever devised and used thousands of years ago has never been improved upon, and is vital to the design and construction of the most delicate and sensitive precision balances in use today.

Weights and measures activity plays a very important part in the life of every human being. This is especially true when we consider that the clothes we wear, the food we eat, the fuel with which we cook our food and heat our homes, and the materials used in constructing our homes all, in one way or another, at some point along the line, have been under the direct supervision of the weights and measures official. Despite its historical effect on our lives, the weights and measures field raises a question in the minds of many today, "Just what is Weights and Measures and in what manner does it affect our daily lives?"

Well, I have heard it said that there could be no surer or quicker way of creating chaos than suddenly to abolish or eliminate all standards of weight and measure. Let us visualize for a moment such a condition. The housewife, who is the accepted purchasing agent in our families, enters the market place to buy the necessities of her family. She may have in mind the purchase of meat, vegetables, milk or cream, or possibly cloth to use in making a dress for her child.

If there were no standards of weight or measure, her request to the storekeeper would be "a piece of beef for roasting, a basket of potatoes, a basket of spinach, a pail (or other container) of milk." In each instance the quantity is indefinite. The dealer would be within his rights to hand her a large basket or a small basket, a large portion or a small portion, or any quantity that would suit his own convenience, and price it accordingly. The purchaser would have to be content to pay whatever price the merchant asked. There would be absolutely no means of satisfying the purchaser that the contract she had just concluded and the quantity she had received was equitable with that which she might expect to receive from other merchants. This method would mean the elimination of competitive dealing or bargaining, and it has long been established that competition is most necessary for effective bargaining.

As a result, such transactions could only mean inequities in dealings between seller and buyer for it would always be the dealer's prerogative to set the quantity of the commodity to be delivered, and the price to be charged. Since there would be no opportunity for question or redress, the consumer would suffer.

With a knowledge of the history of weights and measures activity, we know that the standards used in the market places within this very city are identical with those used on the other side of the world. Uniformity of standards, uniformity of method of sale of commodities, and proper enforcement of weights and measures statutes combine to establish confidence between buyer and seller.

In attempting to develop uniformity, we must be very careful always to recognize trade practices and bring our regulatory program into operation with a general understanding of all parties involved. A recent experience in New York State might help others in this respect. The milk distribution business is a tremendous business in New York State. We had never had a fill-point regulation for our glass bottles of fluid milk. All bottles were supposed to be filled to the cap-seat. We decided, in the interest of uniformity with other States and perhaps to do a better job ourselves, we would develop fill-point regulations. We called a public hearing, but for some reason or other no one showed up, so we instituted the regulation to become effective on January 1, 1958. Instructions were sent out by our Bureau of Weights and Measures to local weights and measures officials. After some of the local weights and measures officials informed the industry that they must destroy all cap-seat bottles on January 1, the whole industry became aroused. One company in New York has over a million and a half bottles on hand at all times and figures a replacement of some 150,000 per month. It became an economic problem and an operational problem of no small consequence. I believe the operational problem is being worked out, but in the course of the discussions that followed, and although our law sets up volumetric standards, we became involved in weights of a quart of milk at different temperature, and the calibration of bottles to fill point at various temperatures. This was brought about, I believe, because we are operating in our State under milk orders and the milk is purchased by the dealers by weight, and the Market Administrator makes the processors report the various utilizations by weight. It does point up, however, the importance and necessity of being most cautious in making changes.

When one considers that all commodities must be sold in some definite unit, together with the important part the weights and measures official has in transactions between buyer and seller, it is surprising that this activity does not always enjoy a more prominent role in the functions of government.

This thought was brought to my mind quite forcefully in a moving picture some years ago, the name of which, as I recall, was "Mr. Smith Goes to Washington."

Mr. Smith was a young man who had been elected to the Senate from a district in the west. He was aggressive, a capable orator, and had what might be called a worthwhile nuisance value. When a bill that he did not favor was being pushed through, he opposed it and conducted, single-handedly, a successful filibuster.

The old guard got together and drew up plans which, of course, did not include Mr. Smith. As their private meeting was breaking up one of them asked, "What shall we do about Mr. Smith?"

After a moment's silence one of the other members answered, "Oh, shucks! We'll make him chairman of some unimportant committee—something like Coinage, Weights and Measures."

I wonder if this attitude is caused by a weakness in the public relations programs of weights and measures officials?

An enforcement agent can be most capable and conscientious in devotion to his duty, but if news of his ability and the service he renders fails to reach outside the circle in which he travels, he will never receive proper recognition for his work and its importance to the community.

In some jurisdictions, weights and measures activity is more or less dormant, while in others, the official is active and aggressive to the point where he occupies a foremost position in government. Such a position can only be attained and enjoyed through a sincere and diligent effort. To accomplish this end, it is necessary that the individual has the initiative and is thoroughly sold on the job to be done, otherwise he cannot hope to convince others of its value.

An example of this is apparent in one of the counties in a metropolitan area of my own State. Some 25 years ago, the Weights and Measures Department in this particular county consisted of a sealer and one deputy. Today the same department consists of the same sealer who held office 25 years ago and 12 deputies. No doubt this sealer has what it takes and has been successful in selling himself and his ability to the people of his county, for their cooperation has helped him build his program and its effectiveness to its present proportions.

Each deputy in this particular county works an 8-hour day, 5 days each week, and a report of his activities is handed in at the completion of each day's work. So, in this instance, this is not building a larger bureau, but developing a program to keep pace with the times.

It appears that in too many instances the position of the weights and measures official is considered a part-time job. Such an approach is not desirable because all too frequently the official is inclined to devote entirely too little of his time to weights and measures work.

Take the matter of enforcement. If you hope to make a weights and measures program effective, the method of enforcement must be uniform. What is condemned on one side of a city, county, or State line cannot be condoned on the other side, if the activity as a whole is to gain and retain the good will and respect of all.

An outstanding example of the ineffectiveness of a part-time official exists in a small upstate community. The office of Sealer of Weights and Measures was vacant. As is true in many places, the officer was to be named or appointed by the Mayor with the approval of the Common Council. The majority in the Common Council was of one political faith and the Mayor of another. Several candidates were offered by the Mayor, only to be refused by the Common Council. The Common Council, in turn, suggested several candidates, each of whom was rejected by the Mayor.

It was finally decided that a competitive examination be held and the candidate receiving the highest mark receive the appointment. In due time the examination was held and the top man on the list appointed. It so happened that the candidate was already employed by a local concern as a State-licensed weighmaster and working from 8 a. m. to 5 p. m. five days a week. That did not seem to make any difference. He still received the appointment as Sealer of Weights and Measures. And he is now holding both positions and expects to continue doing so, and the State is powerless to intervene. Just how he hopes to perform the duties of sealer and still hold his other job is beyond my comprehension. An effective official must be on the job and available at any time his presence and services are required. A part-time official means part-time enforcement and this can only bring about a lack of respect for the official and for the laws he enforces. Disrespect of this nature is contagious and is sure to spread to surrounding areas. The result is a weakness of the whole program.

Throughout the nation there is probably as wide a variance from

State to State in the operation of weights and measures programs, as you will find in any field of public service. Tradition and politics seem to have teamed up to bring about this condition. I believe our situation in New York State is far from ideal. For example, the Commissioner of Agriculture and Markets is charged with the administration of the Weights and Measures Law. In other words, the Bureau of Weights and Measures in the Department of Agriculture and Markets is responsible for supervision of all official weights and measures activities in the State. This would be fine if the Department also had the authority to employ the officials needed to carry out a Statewide program. Unfortunately, this is not the case. Although the Department must supervise the enforcement of State Weights and Measures Laws, the county and city sealers are employed by the municipalities.

We all know that such a condition cannot lead to uniform practices in this or any other field. For example, if a local Sealer is dependent upon the good will of the community for retention in his job, he is not inclined to press too hard where infractions occur. And, who could blame him, in a way? We are all human, and self-preservation is still a powerful force. This gets into the general area of local autonomy. I must be frank to say that in the extension or educational field, local autonomy always seemed to me to be supreme, but in the field of regulation, the actual handling of the program by a disinterested agency of government has many advantages as to effectiveness and cost.

The ideal situation for carrying out a uniform, Statewide program would be for the weights and measures officials to be employees of one agency, with the authority to enforce the laws without bowing to local whims or fancies. Under such a setup, if that authority rested with the State Department of Agriculture and Markets, the Commissioner would not have to worry about any directive he issued being disregarded locally.

The important thing to remember is that a Statewide, uniform system of this nature would result in improved enforcement of weights and measures laws enacted for the protection and service of the public.

It is my opinion that a Statewide uniform weights and measures program would benefit the public in several ways. More efficient service and more effective enforcement would be just two of the immediate benefits that would be welcomed by all. Our department already operates—and has been operating for many years—programs of a comparable nature. For example, our Milk Control, Animal Disease Control, Plant Disease Control, and Food Control programs affect every person in the State.

These programs work very effectively, and one reason for their success is that they are not bogged down by the workings of local politics. Practically all the staff members carrying out these programs are competitive Civil Service employees. They were hired because they were qualified by experience, training, and examination, not because they knew some politician, as is the case with most of the city and county sealers.

I want to emphasize now that a number of the local sealers in our State are doing a fine job. However, all of them must necessarily be sensitive to the local political winds, which, as you know, blow often, and sometimes they take very strange twists.

In addition to the problems in New York State, we are also aware of problems in other States. I believe many of them could be solved by wider adoption of sound weights and measures practices now in effect in individual States. In fact, only with the help of organizations such as yours can the use of such programs be extended to States not now employing them. You can be a powerful force by helping to promote wider use of programs that have already established their value in individual States.

You gentlemen have something to sell—a service that is very necessary to the welfare of the public—a service whose value the public does not always seem to fully appreciate. When a person has something to sell, whether it is service, a commodity, or a specialty, the salesman must get his article before his prospect. He must build up interest to the point where the prospect is convinced that ownership of the article or use of the service will be to his advantage. The representatives of industry who are present know this from experience. Your engineers may design and construct a device that is years ahead of anything your competitors offer. Regardless of the quality of the device, it will soon find its way to the scrap pile unless your sales force takes over and “pushes it” to build up interest and desire for ownership in the minds of tradesmen.

Your Committee on Education is very important and can do much for your association along this line. A carefully planned program to inform the public of your activities is vital. The public should be kept constantly informed on weights and measures laws, rules, and regulations, their interpretations, how they are enforced, and the rights of the purchaser and his responsibility. Such a plan is sure to bear fruit and go a long way toward bringing to your work the recognition I feel it so justly deserves. Each local official should be supplied with material from the central committee to carry on his own program of education. This program should include personal appearances before student bodies, Parent-Teacher Associations, Women's Clubs, Men's Clubs, and newspaper, radio, and television coverage.

Such a program will convey information on just what you are doing and how it affects the community's welfare. A program of this type may not show immediate results, but patience and perserverance on your part is certain to bring about the desired effect in due time.

APPOINTMENT OF COMMITTEES

The President made the following committee appointments to serve during the 42d National Conference.

Committee on Nominations: V. D. Campbell, Ohio, Chairman; J. A. Bernard, St. Louis, Missouri; F. M. Greene, Connecticut; G. L. Johnson, Kentucky; C. C. Morgan, Gary, Indiana; J. F. True, Kansas; L. E. Witt, Milwaukee, Wisconsin.

Committee on Resolutions: H. M. Turrell, Pennsylvania, Chairman; T. C. Beck, Oklahoma; J. M. Dietz, Union County, New Jersey; H. N. Duff, Colorado; M. M. Emerick, Illinois; J. G. Gustafson, Minneapolis, Minnesota; J. D. Walton, Dallas, Texas.

PRESENTATION OF HONOR AWARDS

Dr. Astin presented “Honor Awards” to 25 members of the Conference who, by attending last year's meetings, reached one of the four

attendance categories for which recognition is made, that is, attendance at 10, 15, 20, and 25 or more, meetings. The presentation of these awards was authorized by the 40th National Conference and inaugurated last year during the opening ceremonies of the 41st Conference.

HONOR AWARD RECIPIENTS

25-Year Certificates

L. V. Judson, J. G. Rogers.

20-Year Certificates

None.

15-Year Certificates

R. S. Ackerman, G. Denny Moore, A. O. Oslund, A. T. Smith, F. G. Williams.

10-Year Certificates

James Arrandale, A. C. Becker, J. M. Boucher, W. R. Cornelius, R. W. Crouch, Jr., F. C. Harbour, A. W. Howe, Jr., W. M. Hoxie, W. H. Jennings, J. T. Kennedy, T. B. Middleton, Arthur Sanders, R. W. Searles, R. K. Slough, J. N. Todd, W. K. Tripple, F. M. Warner, Tom Webb.

**REPORT OF THE SPECIAL COMMITTEE OF VICE PRESIDENTS
OF THE CONFERENCE, PRESENTED BY J. E. MAHONEY, CHAIRMAN**

Your Vice Presidents have met as a committee for the purpose of proposing to the Conference, for its nomination, the names of 2 persons to fill vacancies on the Weights and Measures Advisory Committee to the Director, National Bureau of Standards, the vacancies being created by the expiration of the terms of 2 of the original members of the Advisory Committee—Mr. John P. McBride, Director of Standards, State of Massachusetts, and Mr. Harry J. Kennedy, Vice President of Marketing, Continental Oil Company, Houston, Texas.

Mr. Kennedy has represented the petroleum industry on the committee, and, although other commitments have prevented his participation in many of the committee activities, his advice and counsel have been sought by the other members of the committee and always generously given.

Mr. McBride has served the committee either as its cochairman or chairman since its inception, and has been a strong force in the success of the committee in its service to the National Bureau of Standards. He has presided at all meetings of the committee, and his long and outstanding career in weights and measures service has stood him and the committee in good stead. Both the National Conference on Weights and Measures and the National Bureau of Standards are grateful to Mr. McBride for his contributions and for his willing efforts that have exemplified the true meaning of the word "service."

To fill the vacancies thus created and to serve 3-year terms on the Weights and Measures Advisory Committee, your Vice Presidents submit for your nominations the names of Mr. Rollin E. Meek, Director, Division of Weights and Measures, State of Indiana, and Dr. Leland J. Gordon, Weights and Measures Research Center, Denison University, Granville, Ohio.

Mr. Meek's background in weights and measures administration and his contributions to the National Conference are well known to the delegates. He will bring to the Advisory Committee excellent qualifications and a history of accomplishment.

Dr. Gordon will represent the consumers and will provide the committee with an academic approach. He has just completed, undoubtedly, the most comprehensive survey and study of State weights and measures supervision that ever has been undertaken in this country. The knowledge gained through this study should enable him to provide the Director of the National Bureau of Standards, through this Advisory Committee, with the type of information that will allow the Director to support, at the Bureau, such efforts as will be of maximum benefit to the States and, through them, to all of industry, business, and the consuming public.

(The report of the Vice Presidents was adopted by the Conference.)

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 4, 1957

(J. E. MAHONEY, VICE PRESIDENT, PRESIDING)

ROLL CALL OF STATES

The Secretary called the roll of States. Delegates and their ladies were introduced individually. Delegates from 38 States, the District of Columbia, Puerto Rico, and Alaska responded. Responses were also made by representatives of England, Canada, and Indonesia.

(Written reports from many States and Associations were supplied to the Secretary in advance of the Conference. These were duplicated and distributed.)

REPORT OF THE STUDY COMMITTEE ON THE ORGANIZATION OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES, PRESENTED BY R. E. MEEK, CHAIRMAN

The Tentative Report of the Committee was released and distributed on March 18, 1957. There was included therein an invitation for written comment, as a result of which the Committee received only 5 communications. Four of these were from weights and measures officials, and one from a representative of industry.

Yesterday morning (June 3) there was scheduled an open Committee meeting, for the purpose of receiving oral comments on the Committee's Tentative Report. This meeting was well attended and discussions took place on numerous aspects of the Committee's Tentative Report, the recommendations of which were reviewed section by section.

As a result of the comments received by mail and developed in the hearing, the Committee now proposes the addition of a very few words in sections 1 and 3 of the Statement on Organization and Procedure as given in the Tentative Report of the Committee, in order that specific mention may be made of "consumers" as a group with which the National Conference desires to maintain cooperative relations. It is proposed further, that there be added in section 5 of the Statement a parenthetical explanation, spelling out just what is meant by a "rotating basis" for membership on standing committees of the Conference.

With these changes, the Committee feels that the Statement on Organization and Procedure is adequate for the government of the National Conference, and that it reflects the majority opinion of the Conference membership. This Statement is recommended for adoption.

If the Conference approves the organization proposed by the Committee, it is recommended that this become effective with the adjournment of the 42d National Conference, with the exception that the officers elected this year be those prescribed in the Statement on Organization and Procedure. Thus, the 43d and succeeding Conferences would function under the revised setup.

It may be appropriate to point out that under the proposed form of organization, the office of Chairman carries with it a relatively high degree of responsibility as compared with the office of Vice President under the present system of officers. The Chairman must be prepared to assume new planning and executive duties, working closely with the permanent (*ex officio*) Secretary of the Conference, but assuming responsibility for numerous decisions. It is assumed that the Chairman will appoint his committees well in advance of the meeting at which they will serve, so that those committees may plan in advance for their activities, and that he will apportion among his vice chairmen, appropriate duties to be performed by them to assist him in the conduct of the meetings.

(Mr. Meek read to the Conference those portions of the Statement as proposed to be changed from their text as given in the Tentative Report, but did not read that report in its entirety. For the purpose of providing a permanent record for future reference, the entire text of the Tentative Report of the Committee, including the three additions proposed to be made to the Statement, is here included.)

**TENTATIVE REPORT
OF THE
STUDY COMMITTEE ON THE ORGANIZATION OF THE
NATIONAL CONFERENCE ON WEIGHTS AND MEASURES**

Introduction

This Study Committee was appointed in August, 1956, by Dr. A. V. Astin, President of the National Conference on Weights and Measures, upon the recommendation of the Weights and Measures Advisory Committee and of the Executive Committee of the National Conference. The assignment of the Committee has been to consider the general questions of organization and rules of procedure and operation for the National Conference, and of the relationship between the Conference and the National Bureau of Standards, and to make such recommendations in the area of its assignment as it deems proper. The membership of the Committee is as follows: Rollin E. Meek, State of Indiana, Chairman; John P. McBride, State of Massachusetts; William A. Kerlin, Alameda County, California; Howard E. Crawford, City of Jacksonville, Florida; Herman Fakler, Millers' National Federation; James E. Moss, American Petroleum Institute; Arthur Sanders, Scale Manufacturers Association, Inc.

This tentative report presents the preliminary and tentative conclusions of the Committee. Written comment is invited to guide the Committee in reaching final conclusions; such comment should be addressed to the Chairman, Rollin E. Meek, 1330 W. Michigan St., Indianapolis, Ind. An open hearing will be held by the Committee on Monday, June 3, 1957, at the Sheraton-Park Hotel (headquarters for the 42nd National Conference), Washington, D. C., starting at 9:00 a. m., at which oral testimony is invited from all desiring to comment; final conclusions of the Committee will be formulated as soon thereafter as practicable.

Following its organization, the Committee gave wide publicity to a general invitation "extended to weights and measures officials, and to representatives of equipment manufacturers, industry, business, and consumer groups, to transmit to the Study Committee, in writing, any suggestions or comments on the subject of National Conference organization or procedures that they may care to offer." This invitation was supplemented by personal contacts and correspondence with individuals, in an effort to obtain as much helpful information as practicable. In January, 1957, the Committee met in Washington for 2 full days, during which it received oral testimony from the Director of the National Bureau of Standards, the Bureau's Legal Advisor, and the Chief and Assistant Chief of the Bureau's Office of Weights and Measures, and engaged in exhaustive discussion of all aspects of its assignment and of the comments received up to that time from all sources.

The concluding section of this report presents a proposed statement relative to the Organization and Procedure of the National Conference on Weights and Measures, envisioned by the Committee as a document to be printed and kept available for free distribution, for the information of all concerned or interested in the National Conference. Preceding that statement, this report presents comment by the Committee, consisting largely of discussions of certain

elements of the statement, but offering some few comments on matters not considered appropriate for incorporation in the statement.

A Statement on Organization and Procedure Versus a Constitution and Bylaws

The Committee agrees with those who urge that the National Conference organization and procedures be kept as simple as practicable. In fact, it believes that much of the past success of the Conference has stemmed from the simplicity of the Conference organization and the relative informality of its operation. The Committee does see a need, however, for formalization to the extent of documenting the organization and the simple procedural rules necessary for orderly and efficient operation. Since a constitution and bylaws connote a degree of formalization and fixity of procedure considered both unnecessary and undesirable in the case of the Conference, such a document as the end result of the Committee's study was discarded in favor of the more simple "statement on organization and procedure." The Committee is confident that such a "statement" will satisfy every real need and will tend to point up the true character of the National Conference. The document submitted later herein is believed to be adequate for this purpose.

Objectives of the National Conference

It has seemed appropriate to the Committee that the statement relative to the Conference begin with a section setting forth the objectives of the National Conference, and such a section has been prepared and is included.

Relationship Between the National Conference and the National Bureau of Standards

There was essential unanimity among those sending comments to the Committee to the effect that a continuance of association with the National Bureau of Standards is essential to the continued success of the National Conference. With this, the Committee agrees. The character of that association must however, be defined by the Bureau and not by the Conference. In resolving this matter, the Committee received the cooperation of the Director of the Bureau, who, at the Committee's request, supplied a carefully phrased statement of the Bureau's relationship to the Conference, setting forth clearly and succinctly—and perhaps for the first time in written form—those services that the Bureau can properly render to the Conference under its statutory authority to cooperate with the States in promoting weights and measures uniformity. This assistance by the Director of the Bureau is appreciated, and the statement in question is embodied in the statement on organization and procedure developed by the Committee.

In the course of its discussions with the Director, the Committee learned that while the Bureau is prepared to maintain its generous cooperation with and assistance to the National Conference, Dr. Astin does not wish to place the Bureau in the position of controlling Conference action in any way, he wishes to avoid any semblance of personal dictation to the Conference, and he desires to promote the independence of the Conference as an effective weights and measures body. In its proposed statement on organization and procedure, the Committee has introduced some innovations that are believed to be sound and that also give effect to some of the views of the Director of the National Bureau of Standards. The principal change of this character is the provision for a Conference Chairman, to be elected from the active membership of the Conference, and to serve as the principal presiding officer of the Conference, thus relieving the Director of the Bureau of any responsibilities in connection with the conduct of the meetings, while retaining him in his position as President of the Conference, a position indicative of the relationship between the Conference and the Bureau.

Membership in the Conference and on Committees

It was suggested to the Committee that special recognition be given to the representatives of the various Federal agencies who participate in the Conference and contribute to its success. The Committee concurs in this suggestion. With the benefit of advice from the Director of the National Bureau of Standards, there has been incorporated in the statement a plan to implement this suggestion, as follows: Restrict "active" membership to weights and measures officials actively engaged in regulatory work. Establish a new, nonvoting membership category to be known as "advisory", to embrace *all* Federal representatives concerned with weights and measures officials or their activities, or interested in the objectives or activities of the Conference. Retain the nonvoting "associate" membership as at present. Limit appointments to the annual and standing committees of the Conference to active members. Provide for the appointment, when deemed advisable, of advisory and associate members as consultants to

standing committees. Provide for appointment to membership on special committees of active, advisory, and associate members in any combination deemed appropriate.

Officers and Committees

The Committee believes that the Director of the National Bureau of Standards and the Chief of the Bureau's Office of Weights and Measures should be, *ex officio*, the President and the Secretary, respectively, of the National Conference, and that all other officers of the Conference should be elected. Mention has already been made of the new office of Conference Chairman. To assist the Conference Chairman as required, provision is made for four Conference vice chairmen. Under this system of Conference chairmen there would be no need for vice presidents. A Treasurer and a Chaplain would complete the list of officers, the Committee seeing no need for continuing the present office of sergeant-at-arms.

The Committee reviewed very carefully certain details relating to Conference committees. It was decided to adhere, in general, to the present organization and functions of such committees as set forth in pages 20 and 21 of the Report of the 40th National Conference, but with some changes as follows:

Provision is made for annual appointment of an auditing committee, primarily as a protection to the Treasurer. It is provided that the nominating, resolutions, and auditing committees be appointed by the Conference Chairman, and that special committees be constituted, and vacancies on standing committees be filled, by appointment, by the President; this division of appointive power between Conference Chairman and President is believed, by the Study Committee, to be appropriate to the functions of these 2 officers and to their relations to Conference activities. The Committee discussed, at length, the question of the size of the Executive Committee, and arrived at the conclusion that the present complement of 15 elected members, these being in addition to the officers who are members *ex officio*, is disproportionately large when compared with the total of the active membership of the Conference; accordingly, it is provided that the officers plus 10 elected members shall constitute the Executive Committee. It is also provided that the Conference Chairman and Secretary shall serve the Executive Committee in like capacity, that vacancies in elective offices may be filled by the Executive Committee, and that the Executive Committee may act for the Conference in any emergency situations that may arise between meetings of the Conference.

Voting Procedure

In the Committee study of Conference voting procedure, an individual analysis was made of the attendance of all delegates of all jurisdictions for all 41 meetings of the National Conference. Careful consideration was then given to all of the many suggestions received from outside sources; these had been made by officials and others in an effort to provide a more equitable system of voting, and included proposals such as:

One vote (or the same number of votes per State.

One vote per jurisdiction (State, county, or city).

Voting by State unit rule.

Weighting votes on the basis of State electoral votes.

Weighting State votes above county votes and county votes above city votes.

Postponing votes on certain questions.

Restricting voting (on all or certain questions) to specified delegates—for example, State delegates; chiefs of jurisdictions or their authorized representatives; delegates authorized to promulgate regulations; delegates previously selected to represent their States; delegates experienced in the matter at issue.

Consideration was also given to the specific suggestion, well distributed among representatives of State, county, and city jurisdictions, to the effect that the present voting procedure be continued without change.

It was felt that none of the suggestions for improving the voting procedure provided cure-all, or even offered a reasonable probability for over-all improvement when all of its implications and collateral effects were studied. For example, equality in the number of votes per State or per jurisdiction would not reflect equality in weights and measures activity, experience, or judgment. The several weighting bases proposed were open to similar objections, plus the added objection that under these plans the taking of a vote would be seriously delayed and complicated. To postpone decisions on important questions might well work a serious hardship upon officials and business and manufacturing interests. Any restriction upon voting privileges based upon the character of jurisdiction repre-

sented is discriminatory in essence, and would be almost certain to alienate certain valuable constituents of the Conference membership, seriously reduce interest in the proceedings on the part of those active members relegated to the position of mere observers, and reduce attendance by a very considerable amount.

Nor was the Committee itself able to devise a new procedure that it could confidently recommend as an improvement over the current procedure—again after an analysis of each effort in this direction, made to develop such factors as its basic equity, its practical fairness to the several elements comprising the active membership of the Conference, its effect on the simple, smooth, and expeditious transaction of Conference business, its effect on holding present attendance and on attendance growth, and its effect on the rise or decline of interest in the activities of the Conference.

Though the Committee is fully aware of certain theoretical inequities inherent in the current voting procedure of the Conference, and of the possibility of certain minor abuses under that procedure, it is strongly influenced by the considerations outlined above and by the undisputed fact that through the years the National Conference, under the system of voting that has prevailed, has established an enviable record of constructive accomplishment. It is believed, moreover, that there is an increasing sense of responsibility on the part of the Conference membership, and that by and large this membership can be relied upon to exercise good judgment and a proper restraint in exercising its voting right; thus can potential abuses be kept from becoming actual faults.

Accordingly, it is the conclusion of the Committee that the best interests of the National Conference will be served by making no change in voting procedure at this time, and by continuing in effect the voting procedure as it now exists, and this is provided for in the statement on organization and procedure recommended by the Committee for Conference approval.

Changes in Organization and Procedure

The Committee believes that provision should be made for some stability in the organization and procedural rules of the Conference, to guard against possible hasty or capricious changes. Accordingly, it is provided that any proposal for such changes be not acted upon until the meeting of the Conference following the meeting at which such proposal is made.

Parliamentary Procedure

It appears appropriate to the Committee to include a provision that issues of parliamentary procedure be resolved according to Robert's Rules of Order. This is not to be construed as a recommendation for rigid adherence to all of the details of procedure set forth in the cited Authority, a course of action that might actually hamper and delay the smooth transaction of Conference business. The objective is merely to provide a definite basis for adjudicating such serious questions of parliamentary procedure as may occasionally arise.

Miscellaneous Matters Not Covered by the Statement on Organization and Procedure

It is the feeling of the Committee that the place for the meetings of the Conference should be fixed by the Conference. However, the Committee wishes to report its thought that, for the present, these meetings should be held in Washington, D. C. It may be noted in relation to the meeting place that the Committee thinking is in agreement with opinions expressed by the large majority of those who commented on this point in letters to the Committee.

The question of minority committee reports having been raised in a communication to the Committee, it is desired to express the Committee's opinion to the following effect. If the members of a Conference committee are unable to reach unanimous agreement on all or any part of the committee's report, and if the minority of the membership feels that it cannot, in good conscience, yield to the majority judgment, and that, moreover, the matter at issue is of such importance as to justify the presentation to the Conference of a divided committee recommendation, then the submission of two committee reports, representing the majority and minority opinions, respectively, is entirely in order.

The Study Committee received several suggestions for earlier distribution of the tentative reports of the standing committees of the Conference. The advantages of early availability of these reports are recognized, and it is urged that every reasonable effort be made to lengthen the interval between their advance distribution and the opening date of the Conference. It should be emphasized, however, that many factors are involved in the preparation and distribution of committee reports, some of which are difficult to regulate. Also, the Committee is advised that as a practical matter it is necessary for the Office of Weights and Measures of the Bureau to restrict the general report distribution

to a single mailing, which means that no reports can be sent out until all are ready. It is apparent, therefore, that earlier report distribution can be realized only by a joint effort on the part of all concerned—committed chairmen, committee members, and persons and agencies cooperating or otherwise dealing with committees, as well as the limited staff of the Office of Weights and Measures.

The Study Committee commends the policy on the part of Conference committees of calling upon various interests for information and suggestions, and of welcoming representatives of manufacturers, industry, and business who desire to present matters for committee consideration. The practice on the part of manufacturers, industry, and business of designating specific committees or panels to represent them before Conference committees is likewise commended, and in the interest of cultivating mutual understanding of problems and of expediting the interchange of ideas so necessary to constructive action, it is urged that this practice be extended.

The Committee strongly endorses the long-standing practice on the part of the National Bureau of Standards of recommending to the States the promulgation of appropriate regulations and the enactment of model laws adopted by the National Conference, and recommends that this practice be continued.

The Committee concurs in the suggestion received from various sources to the effect that at any meeting of the Conference, reports of standing committees be scheduled for Conference action prior to the concluding day of the meeting.

The Statement on Organization and Procedure

The results of the deliberations, up to this time, of the Study Committee are crystalized in the statement on the organization and procedure of the National Conference on Weights and Measures that is presented below. The Committee believes that this covers, in adequate detail, the elements that require treatment in order to present an informative summary of what the Conference is and how it functions, and to provide a simple and practical pattern for the operating procedures of the Conference. In this statement the Committee has deliberately avoided the use of the mandatory word "shall", believing it preferable to present the information in simple statement form rather than in the form of a set of rules.

THE ORGANIZATION AND PROCEDURE OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

1. Objectives

The objectives of the National Conference on Weights and Measures are (a) to provide a national forum for the discussion of all questions related to weights and measures administration as carried on by regulatory officers of the States, Commonwealths, Territories, and Possessions of the United States, their political subdivisions, and the District of Columbia; (b) to develop a consensus on model weights and measures laws and regulations, specifications and tolerances for commercially used weighing and measuring devices, and testing, enforcement, and administrative procedures; (c) to encourage and promote uniformity of requirements and methods among weights and measures jurisdictions; and (d) to foster cooperation among weights and measures officers themselves and between them and all of the many manufacturing, industrial, business, and consumer interests affected by their official activities.

2. Relationship With the National Bureau of Standards

The basic relationship between the National Bureau of Standards and the National Conference on Weights and Measures is sponsorship by the National Bureau of Standards of a means for the promotion of uniformity among the States in the complex of laws, regulations, methods, and testing equipment that comprises regulatory control by the States of commercial weighing and measuring. (This sponsorship is exercised under authority of that portion of the organic Federal Act under which the Bureau is authorized to undertake "cooperation with the States in securing uniformity in weights and measures laws and methods of inspection.")

Within the limitations of the funds available, the National Bureau of Standards assists the Conference by supplying technical information, guidance, and secretarial services, to the end that the Conference may operate effectively, constructively, and with fairness toward all affected interests.

Within the limitations of applicable Federal authorization and policy, the National Bureau of Standards publishes and distributes reports of the proceed-

ings of the meetings of the Conference, reports of Conference committees, and model laws, regulations, specifications, and tolerances adopted by the Conference.

In exercising its cooperation with the Conference, the National Bureau of Standards acts primarily through the Office of the Director and specifically through the Office of Weights and Measures.

3. Constituent Membership

Membership in the Conference is of three classes, active, advisory, and associate.

Active membership is limited to weights and measures officers actively engaged in regulatory service and in the employ of States, Commonwealths, Territories, and Possessions of the United States and their political subdivisions, and the District of Columbia.

Advisory membership comprises representatives of agencies of the Federal Government who are concerned in any way with regulatory weights and measures officers or their official activities, or who are interested in the objectives and activities of the Conference.

Associate membership comprises representatives of manufacturers, industry, business, consumers, and other persons, who are interested in the objectives and activities of the Conference.

Active, advisory, and associate membership is on an annual basis and is effectuated through registration at a meeting of the Conference and, in the case of active and associate members, payment of the currently prescribed registration fee.

Members of all classes have the privilege of the floor at meetings of the Conference.

4. Officers

The Director of the National Bureau of Standards and the Chief of the Office of Weights and Measures of the Bureau of Standards are, *ex officio*, the President and the Secretary, respectively.

A Conference Chairman, four Conference vice chairmen, a Treasurer, and a Chaplain are elected from the active membership, their terms of office running from the adjournment of the meeting at which they are elected through the succeeding meeting.

5. Committees

The annual committees are a Nominating Committee of seven members, a Resolutions Committee of seven members, and an Auditing Committee of three members, appointed by the Conference Chairman from the active membership, and an Executive Committee consisting of all of the officers, *ex officio*, and ten members elected from the active membership. The committees appointed by the Chairman serve during his term of office. The term of the Executive Committee runs from the adjournment of the meeting at which its members are elected through the succeeding meeting.

The standing committees are the Committee on Specifications and Tolerances, the Committee on Laws and Regulations, and the Committee on Education, each with a normal complement of five members appointed by the President from the active membership on a rotating basis for five-year terms (one new member being appointed, and one old member retiring, each year), except when the appointment is to fill a vacancy caused by the death, resignation, or retirement from active service of a committee member, in which case the appointment is for the unexpired portion of such member's term. Each standing committee annually selects one of its members to serve as its chairman. At his option, the President may designate one or more advisory or associate members as consultants to a standing committee.

Special committees are appointed by the President from the active, advisory, or associate membership, in any combination deemed appropriate, as the need arises or the Conference requests. The life of a special committee is fixed as a definite period, not to exceed two years. At the expiration of the fixed period, the committee ceases to exist, except that the life of a committee appointed to serve for one year only may, by action of the Conference, be extended for one year. If it is found necessary to establish a new special committee to carry on the activities of a committee so dissolved, the appointments are so made that the personnel of the new committee includes at least two persons who did not serve on the precedent committee. At his option, the President may designate the Conference Secretary as consultant or nonvoting secretary or both to a special committee.

6. Duties of Officers

The President addresses each meeting of the Conference, normally at the opening session, presenting matters of interest to the body and suggesting areas of discussion and study, and makes appointments to standing and special committees.

The Conference Chairman is the principal presiding officer at meetings of the Conference and of the Executive Committee, and makes appointments to the nominating, resolutions, and auditing committees.

The Conference vice chairmen assist the Conference Chairman in the discharge of his duties, serving as directed by him.

The Secretary acts as secretary and executive officer of the executive committee and as nonvoting secretary to each standing committee, handles all details in connection with the arrangements for and the programs of the meetings, keeps the record of the proceedings of the meetings, and certifies to the Treasurer the correctness of bills rendered to the Conference for payment.

The Treasurer receives and accounts for all monies collected as registration fees, and pays all Conference bills certified by the Secretary as correct.

The Chaplain performs the duties customarily attendant upon that office.

7. Duties and Fields of Operation of Committees

The Nominating Committee annually presents a nonexclusive slate of nominees for all elective offices and for the ten elective memberships on the executive committee.

The Resolutions Committee annually presents for Conference action such resolutions as it has been directed by the Conference to prepare, and such additional resolutions as are deemed appropriate by the committee.

The Auditing Committee annually audits the books of the Treasurer and reports its findings to the Conference.

The Executive Committee reviews the general activities of the Conference and its committees, makes such recommendations to the Conference, the Conference officers, and the committee chairmen as it deems appropriate, advises with the Secretary with respect to the programs for the meetings, may at its option fill any vacancy in an elective office caused by death, resignation, or retirement from active service, and selects the dates and headquarters for the meetings. In the interim between successive meetings of the Conference, the Executive Committee acts for the Conference in any emergency situations that may arise.

The Committee on Specifications and Tolerances annually presents a report for Conference action. Its field of operation embraces all matters dealing with (a) specifications, tolerances, regulations, and requirements of any kind, relating to commercial scales, weights, measures, and weighing and measuring devices and accessories, including interpretation of such material whenever necessary, (b) standards and testing equipment for weights and measures officials, and (c) procedures for testing commercial equipment.

The Committee on Laws and Regulations annually presents a report for Conference action. Its field of operation embraces all matters dealing with model laws, model regulations, bills introduced for legislative enactment, methods of sale of commodities, and general and administrative provisions, relating to weights and measures supervision in general, but exclusive of such matters as are within the jurisdiction of the Committee on Specifications and Tolerances.

The Committee on Education annually presents a report for Conference action. Its field of operation embraces all matters dealing with the technical training and education of weights and measures officials, the education along weights and measures lines of the general public and of the users of weighing and measuring devices, and the public relations programs and procedures for weights and measures organizations, but exclusive of such matters as are within the jurisdiction of the Committee on Specifications and Tolerances.

8. Voting

All questions before a meeting of the Conference are decided by majority vote of those active members present and voting.

9. Procedures

The Conference officers and committees observe in all of their procedures the principles of due process—the protection of the rights and interests of

affected parties; specifically, they (a) give reasonable advance notice of contemplated committee studies, items to be considered for committee action, and tentative or definite recommendations for Conference action, for the information of all parties at interest, and (b) provide that all interested parties have an opportunity to be heard by committees and by the Conference.

10. Changes in Organization and Procedure

Proposals for changes in organization or procedure of the Conference are not acted upon until the meeting of the Conference following the meeting at which such proposal is made.

11. Parliamentary Procedure

Issues on parliamentary procedure are resolved according to Robert's Rules of Order.

With the presentation of this report, the Study Committee on the Organization of the National Conference on Weights and Measures considers its responsibility to have been discharged, and prays that it be dissolved.

Mr. Chairman, I move that the sentiments and recommendations of the Study Committee, as expressed in its written Tentative Report and qualified and amplified in the oral final report just concluded, be approved and adopted.

(The motion was seconded, the question was taken, and the motion was adopted unanimously.)

[Secretary's Note.—The Statement of the Organization and Procedure of the National Conference on Weights and Measures, as approved by the 42d National Conference, has been published as a brochure, copies of which may be obtained without cost upon application to the Office of Weights and Measures of the National Bureau of Standards.]

THE DEVELOPMENT OF WEIGHTS AND MEASURES CONTROL IN THE UNITED KINGDOM

By T. G. POPPY, *Controller of the Standards, Standard Weights and Measures Department, Board of Trade, London, England*

Introduction

1. The subject I have chosen for my paper today could have been treated in a number of different ways and in varying degrees of detail. I could have dealt, for instance, with the progress of the inspection and verification of weights and measures in my country from Saxon times to the present, describing successively the inspection functions of the old Court Leet, the Annoyance Juries, the Town Juries, the County Commissioners and the Clerks of the Markets, together with the verification functions of Sealers, Stampers and Examiners of Weights and Measures; I could have described the many regulations relating to weights and measures which have been made from time to time, including such things as the Assise of Bread and Ale of the 13th Century, the aulnage or measurement and assise of cloths, the regulation of cheese, honey and coal and so on; or I could have limited myself to the fascinating history of the basic standards—the yard and the pound. Any one of these aspects would, I think, have held the interest of an American audience, but none of itself would have accomplished what I had in mind when I was asked to present a paper to this Conference. What I wanted to do was to survey in broad outline the development of control, showing how and

why our present system came into being and where it might possibly lead to in the future. I intended my paper, in fact, to be both supplementary and complementary to the paper written by my predecessor, Mr. R. J. Trump, and read to this Conference by Mr. F. S. Holbrook (late of the National Bureau of Standards) on the 11th June, 1936.

2. I had to recognise, however, that any attempt to commence with the laws of ancient times and trace the development of control in detail right up to the present, would have meant an excessively long paper. I have, therefore, chosen as my starting point the first half of the nineteenth century, the period in which our present system of control was born.

The Era of King George IV (1820-1830)

3. Eighteen-hundred and twenty-four was one of the most important years in the history of British weights and measures, for in that year, Parliament passed "an Act [1]* for ascertaining and establishing uniformity of Weights and Measures." There had been earlier Acts ascertaining or establishing standards of weight and measure, and even Acts establishing or recognising certain differences between weights and measures of the same name, but conditions had evidently come to such a pass that something had to be done about them. This is evident from the preamble to the Act of 1824 which stated that "different weights and measures, some larger and some less, are still in use in various places throughout the United Kingdom of Great Britain and Ireland, and the true measure of the present Standards is not verily known, which is the cause of great confusion and of manifest frauds"; and the new statute was declared to be for "the remedy and prevention of these evils for the future."

4. The Act itself was founded upon three reports of a Royal Commission [2] set up in 1819, and its major features were the recitation and repeal of a long list of earlier statutes relating to weights and measures, and the establishment of standards which were the basis of our existing so-called "Imperial" system of measurement.

5. Among the standards prescribed in the Act (the distinction between a "unit" and a "standard" was evidently not clearly understood in those days) were the yard, the troy pound, the avoirdupois pound and the gallon: and it is of interest to note, in the first place, that the definitions of the yard and the gallon were almost exactly the same as as the modern definitions of those units, and, secondly, that the troy pound and not the avoirdupois pound, was the basic standard of weight. A standard gallon was moreover required to be made and this was given a status equivalent to that of the yard and the pound, notwithstanding the fact that by definition it was a derived standard.

6. Whether coming events were already casting their shadows before them I do not know, but careful provision was made in the Act for the replacement of the Primary Standards, if by any chance they should be lost, destroyed or irreparably damaged. The basis of the restoration of the yard was to be a pendulum beating seconds in a vacuum at sea level in the latitude of London, and that of the pound, "a cubic inch of distilled water weighed in air by brass weights at the temperature of 62° of Fahrenheit's thermometer, the barometer being at thirty inches."

*Figures in brackets indicate the literature references at the end of this report by T. G. Poppy.

7. Special provision was made for a standard heaped bushel measure for use in the sale of coal, lime, fish, fruit, potatoes and other things normally sold by such measure and the size of the "heap" was precisely defined in terms of the dimensions of a cone resting on the top surface of the standard measure.

8. Standards conforming to the new definitions were ordered to be made and accurately verified for the Exchequer to whose care the central administration was then entrusted, and provisions were incorporated in the Act for supplying verified copies of the new standards to the town and county authorities throughout the Kingdom. All the weights and measures in use for trade purposes were required to be in conformity with those standards. No fresh requirement was made for the verification or inspection of trade weights and measures, the existing system under which this was the responsibility of local examiners being made applicable to the new weights and measures.

9. Uniformity was secured by prescribing that "all contracts, bargains, sales and dealings which shall be made or had within any part of the United Kingdom of Great Britain and Ireland for any work to be done, or for any goods, wares or merchandise or other things to be sold, delivered, done or agreed for by weight or measure, where no special agreement shall be made to the contrary, shall be deemed, taken and construed to be made and had according to the standard weights and measures ascertained by this Act."

10. An interesting note of economy was struck by the inclusion in the Act of a Section prescribing that existing weights and measures which were not in conformity with the new standards need not be scrapped, but could be used provided the ratios which they bore to the new standards were painted or marked on them.

11. The next two Weights and Measures Acts, namely those of 1825 [3] and 1834 [4], can be passed over quickly; the former merely served to postpone the date of operation of the Act of 1824, while the Act of 1834 was repealed in its entirety by a further Act passed one year later. Before going on to mention the salient features of the Act of 1835, however, I would like to refer briefly to another Act which was already in existence at that time. This was the Bread Act of 1822 [5]. This Act only applied to the city of London, but in 1836 a further Act [6] was passed making the Act of 1822 applicable to the whole of the country. The object of these Acts (to quote Mr. Justice Lush in *Reg. V Wood* [7] was, *inter alia*, "to leave the baker at liberty to make bread of any size and shape he pleased and to charge his own price for it: but in order to protect the customer from imposition it (the 1836 Act) requires the baker to sell by weight. He is no longer at liberty to sell at so much per loaf: he must sell at so much per pound: and the customer is to be supplied with so many pounds of bread."

The Era of King William IV (1830-1837)

12. The Weights and Measures Act, 1835 [8] ranks equally, in my view, with the Act of 1824 as a foundation stone of our present system. It was this Act which described local officers for the first time as Inspectors of Weights and Measures and decreed that the duties of inspection and verification were to be executed by the same official. These officers were to be appointed and paid a "reasonable remuneration . . . for the discharge of their duties by the magistrates of every county in Great Britain, every Royal Burgh in Scotland and

every town or other place in the Kingdom possessed of legal jurisdiction by Charter, Act of Parliament or otherwise." They were to be required to enter into a recognisance to the King in the sum of £200 for the due and punctual performance of their duties, and were to be made liable to a penalty for misconduct in the course of their duties.

13. No maker or seller of weights and measures was to be appointed as an inspector and this restriction continues in force today. Furthermore, when the County Police Force was set up in 1839 [9], police officers, being restrained from employment in any other office or for hire or gain, were prohibited from acting as inspectors of weights and measures. This restriction, however, was removed in 1840 [10], and by 1870 it had become the general practice in Great Britain, more especially in the counties, for local authorities to appoint police officers to be inspectors of weights and measures. In recent years the tendency has been in the opposite direction and there is now only one area in England where police officers are employed as inspectors of weights and measures, and even here their connection with the police is purely nominal. There are still one or two instances in Scotland, however, where officers perform both functions.

14. The inspectors were to be provided with standards and stamps and were required to attend at market towns and other places within their jurisdictions and there examine and compare with their standards all weights and measures brought to them for the purpose. Where they found these correct they were to stamp them with an official stamp and a number or mark, distinctive to the inspector's district.

15. In addition, upon being given a general authorisation in writing by a Justice of the Peace, the inspectors were empowered to enter shops and other places within their jurisdiction where "goods are exposed or kept for sale" and there examine and compare with their standards "all weights, measures, steelyards, or other weighing machines." Any weights or measures found to be unjust were liable to be seized and forfeited.

16. The expense of providing standards and stamps and of remunerating the inspectors was directed to be defrayed out of the local rates and assessments.

17. In addition to establishing a uniform system of verification and inspection, the Act of 1835 dealt with several other matters which are worthy of note, as follows:

(a) additional units of weight, including the stone of 14 lb., the hundred-weight of 112 lb. and the ton of 20 cwt. were legalized;

(b) sale by heaped measure was abolished;

(c) trade was required to be carried out in terms of avoirdupois weight only, except for gold, silver, precious stones, and drugs which were required to be sold by troy weight;

(d) the making of unauthorised weights and measures and the selling of un stamped ones were made offences;

(e) the principle of fees for verification and stamping was established;

(f) coal was required to be sold by weight and not by measure;

(g) weights and measures once stamped could be used anywhere in the country, only becoming liable to restamping if they became defective.

18. In the year before this Act was passed, tragedy visited the legislature of the country: the Houses of Parliament were burned down. In the conflagration the imperial standards were either totally destroyed or injured to such an extent as to render them quite useless as standards. The imperial standard troy pound in fact was never recovered from the ruins.

19. In the year 1838, a Commission [11] was appointed to consider what steps should be taken for the restoration of the standards. The Commission sat until 1841, and the most important results of their labours were the platinum weight made in 1844 which is now designated the Imperial Standard Pound and the brass yard made in 1845 which is now the standard for determining the Imperial Standard Yard. The new standards were legalised by Act of Parliament in 1855 [12] and copies were made and deposited in various public offices in London with the object that should the Imperial Standards again be destroyed, they could be restored by references to or by adoption of any of the copies.

The Victorian Era (1837-1901)

20. At this point it is necessary to break away temporarily from the work of the 1838 Commission in order to mention two more Acts of Parliament in their correct chronological sequence. The first was an Act passed in 1859 entitled "An Act for regulating measures used in the Sales of Gas" [13]. I refer to it because for many years the testing of gas meters was carried out by certain inspectors of weights and measures and the overall administration of the Acts and Regulations relating to such meters was entrusted to the Standard Weights and Measures Department of the Board of Trade. These statutory functions, in fact, only passed to the Ministry of Fuel and Power when the gas industry was nationalised in 1948 [14]. Although now repealed, it is of interest to note that the Act of 1859 laid down that the only "Standard or unit of measure for the sale of gas by meter shall be the cubic foot containing 62.321 pounds avoirdupois weight of distilled or rain water weighed in air at the temperature of 62° of Fahrenheit's thermometer, the barometer being at thirty inches."

21. The second was the Weights and Measures (Metric System) Act of 1864 [15] by which the use of weights and measures of the Metric System was first legalised in the United Kingdom. The Act declared that such a step was necessary "for the promotion and extension of our internal as well as our foreign trade and for the advancement of science," and the method of procedure was to declare that no contract or dealing was to be deemed invalid or open to objection on the sole ground that the weights and measures used or referred to were weights and measures of the Metric System. It is interesting to note that in the same Act, decimal subdivisions of the imperial weights and measures were also permitted to be used for trade purposes.

22. Reverting to the work of the 1838 Commission, not all its recommendations regarding the Exchequer standards of weight and measure and the constitution of the Department executing the duties connected with them, were incorporated in the Act of 1855. These matters were further considered by a Standards Committee [16] and eventually (in 1866) another Act of Parliament [17] was passed:

(a) transferring all the duties then imposed by various Acts of Parliament upon the Exchequer in connection with the custody and management of the parliamentary and other standards of weight and measure to the Board of Trade;

(b) establishing a Standard Weights and Measures Department of the Board of Trade;

(c) authorising the new Department to conduct all such comparisons, verifications and other operations with reference to standards of length, weight or capacity in aid of scientific researches or otherwise;

- (d) requiring the Department to make an Annual Report on their proceedings to the Board of Trade, to be laid before Parliament;
- (e) making provision for the reverification of the parliamentary copies of the imperial standards of length and weight and the comparison, readjustment, or renewal of the secondary standards;
- (f) establishing the principle of error allowances in the comparison of standards; and
- (g) abolishing the stamp duty and fees on the verification of standards.

23. The Act directed that the officer to be appointed as Head of the Standard Weights and Measures Department was to be styled the Warden of the Standards, but this title was afterward transferred to the Permanent Secretary of the Board of Trade, the Head of the Department becoming the Deputy Warden. Both these titles are now defunct, the Head of the Department at present being called the Controller of the Standards.

24. The creation of the Standard Weights and Measures Department, however, was only a beginning: there were further recommendations of the old Commission, of the Standards Committee, and of the Treasury still to be considered. So, concurrently with the setting up of the new Department, a further Commission [18] was appointed by Her Majesty Queen Victoria to consider and report how the new Department could be made most efficient. The terms of reference of this Commission were very wide, ranging from enquiry into the condition of the standards transferred from the Exchequer to the Board of Trade, to the correlation of the work of the local inspectors. The Commission sat for six years and made five extremely comprehensive and detailed reports.

25. The result of the Commission's labours was the Weights and Measures Act of 1878 [19] and this Act is the basis of current weights and measures law in the United Kingdom. Virtually all the Acts previously in force were repealed by this Act, although many of the principles contained in them are retained in improved form. The main provisions were incorporated in Mr. Trump's paper in 1936, so that only a brief reference to them is necessary here.

26. The Act—

- (a) defines the Imperial Standard Yard and the Imperial Standard Pound;
- (b) enumerates the secondary standards of measure and weight derived from the imperial standards and lists the metric standards in the possession of the Board of Trade;
- (c) requires all trade by weight or measure to be in terms of one of the imperial weights or measures or some multiple or part thereof;
- (d) establishes penalties for the use or possession for use in trade of a weight or measure which is not of a denomination of one of the imperial standards or of a standard derived therefrom;
- (e) provides for the verification and stamping of weights and measures by inspectors of weights and measures appointed by prescribed local authorities;
- (f) imposes penalties for the use or possession for use for trade of unstamped and unjust weights and measures and for the willful commission of fraud in their use;
- (g) vests the inspectors with powers of entry into trade premises and with authority to inspect and test all weights and measures in use for trade in such premises; and
- (h) makes supplementary and consequential provisions for its effective administration and enforcement.

27. The Act was basically sound, but the passage of time showed a need for amendment and extension of its provisions. Thus, eleven years later, another Act [20] "for amending the law relating to Weights and Measures and for other purposes connected therewith"

was passed. The chief extensions provided by this Act were as follows:

- (a) the establishment of verification and stamping of weighing machines;
- (b) the inclusion of liability to imprisonment with the monetary penalties of the previous Act for offences;
- (c) the empowering of the local authorities to make general regulations (which had to be approved by the Board of Trade in order that a measure of uniformity could be ensured) regarding the procedure to be observed by inspectors in the verification and inspection of appliances;
- (d) the empowering of the Board of Trade to hold local enquiries into the administration of the law within the jurisdiction of any local authority;
- (e) the establishment of examinations by the Board of Trade for ascertaining whether inspectors of weights and measures possess sufficient practical knowledge for the proper performance of their duties; and
- (f) the inclusion of requirements relating to the sale of coal and a reference to the effects of the Act on the existing Bread Acts.

28. During the next fifteen years, three more short Acts of Parliament appertaining to weights and measures matters were passed, but the only one of these that needs to be mentioned here is the Act of 1897 [21] entitled "An Act to legalise the use of weights and measures of the metric system." As I have already mentioned, the use of weights and measures of the metric system had been permitted ever since 1864, the Act of that year having set out a table of equivalents which could "lawfully be used for computing, determining and expressing in weights and measures, weights and measures of the metric system." This Act was repealed by the Act of 1878, only the table of equivalents being re-enacted. The Act of 1897 re-established the position which had obtained more than thirty years before by making weights and measures of the metric system lawful for use in trade on an equal footing with the imperial weights and measures.

29. It is perhaps worth noting at this point that history shows several attempts, particularly at the beginning of the present century, to make the use of the metric system in the United Kingdom compulsory, but none of these attempts was successful. Great Britain did not join the Convention du Mètre until 1884, and it was not until 1894 that the last of the national prototypes of the metre and kilogram were delivered to the Board of Trade by the International Committee. The Act of 1897 constitutes those standards as Board of Trade standards along with the imperial standards of the same status.

The Edwardian Era (1901-1910)

30. The next important amendments to the law relating to weights and measures were made in 1904, the chief provisions of the Act [22] of that year being as follows:

- (a) the conferment on the Board of Trade of power to make general regulations regarding the verification of weights, measures, weighing and measuring instruments, the tests to be applied and the limits of error to be allowed on verification and inspection of such appliances; (replacing the earlier provision of the Act of 1889 under which the local authorities made regulations for the guidance of their inspectors);
- (b) the conferment on the Board of Trade of the duty of examining patterns of weighing and measuring appliances and of giving certificates where they are satisfied that the appliances do not facilitate the perpetration of fraud;
- (c) the conferment of powers of arbitration on the Board in cases of dispute between inspectors and other persons as to the meaning of any regulations made by the Board or as to the method of testing any weight, measure, weighing or measuring instrument;

(d) the conferment of powers on Courts of Law to refer cases of dispute as to the accuracy or efficiency of weighing or measuring appliances to the Board of Trade for determination; and

(e) the conferment of powers on inspectors with the consent of their local authorities to prosecute offences before the Courts.

31. It will be seen that this Act considerably expanded the work of the Standards Department of the Board of Trade by making that Department responsible for uniformity of practice throughout the country whilst not interfering with the work of the local inspectorate.

32. At this point it is necessary to go back in time to another important event which, in later years, was to have a big effect on the work of the Standards Department. I refer to the foundation in 1900 of the National Physical Laboratory, the British counterpart of the National Bureau of Standards. To quote the words of the then Prince of Wales (later King George V) [23] who opened the first of the new buildings in 1902, the Laboratory was founded "to bring scientific knowledge to bear practically upon our everyday industrial and commercial life; to break down the barrier between theory and practice; to effect a union between science and commerce."

33. Up to then, the Standards Department (as it had been known since 1878), in accordance with the instructions laid down by Parliament at its birth and later re-enacted in the Act of 1878, had been conducting "comparisons, verifications and other operations with reference to standards of measure and weight, in aid of scientific researches or otherwise" as the Board of Trade thought expedient. With the advent of the National Physical Laboratory much of this work, particularly on the research side, passed to the Laboratory. So close was the link between the Laboratory and the Department in the early days, that for a period of some ten years the Superintendent of the Metrology Division, the late Mr. J. E. Sears, C. B. E., was also the Deputy Warden of the Standards, spending half his working time in each Department. It was undoubtedly due to Mr. Sears' dual functions that the last decennial comparisons of the parliamentary copies of the yard and pound with the imperial standards to be made by the Standards Department alone were carried out in 1922, and that in 1932, officers of the Department worked side by side with officers of the Laboratory on this task. Since then the Department has taken no part in the practical side of the comparisons. Furthermore by an agreement approved by the Treasury in 1931, the periodical reverification of the Board of Trade first derivative standards of weight and measure against the primary standards has also been transferred to the Laboratory.

34. There is no longer a physical link between the Laboratory and the Department but there is the closest liaison, each organisation being of considerable assistance in its own particular field to the other.

35. At this point, too, it is convenient to say a few words about the regulations which have been made by the Board of Trade under the powers accorded to them in the 1904 Act.

36. The first regulations to be made in pursuance of these powers were the Weights and Measures Regulations, 1907 [24]. These regulations, which have been extended in scope but which have been very little amended in content since they were made, are still in force. Broadly speaking they prescribe the tests to be made and the errors which are to be permitted by inspectors of weights and measures in the verification and inspection of weights, measures of length and

capacity and weighing instruments. It was not until 1921 that regulations relating to measuring instruments were first made and even then the regulations of that year applied only to certain types of leather measuring instruments [25]. It was 1929 before regulations relating to the liquid fuel and lubricating oil measuring instruments [26] were promulgated, but since that date two more sets of regulations have been made, the first relating to cubic yard measures used in the sale of sand and ballast [27] and the second to egg grading machines [28].

The Era of the House of Windsor (1910-Present Time)

37. Taking up the survey of the development of control, once again, the next event of note was the setting up by Parliament in 1914 of a Select Committee [29] to "enquire whether any, and, if so, what steps should be taken to protect purchasers of goods sold in packages, and of bread from short weight or measure." Quite early in their deliberations this Committee came to the conclusion that "purchasers in the wholesale trade are quite well able to look after their own interests and further that unnecessary interference with the course and customs of trade as between buyers and sellers is to be deprecated and is only justifiable for specific and exceptional reasons." They therefore confined their attention to retail trade and except insofar as bread was concerned, their recommendations were very limited. They certainly recommended that short weight or measures in the retail sale of goods should be made a statutory offence, that vendors selling by gross weight should be compelled to inform purchasers of that fact and that false oral representation as to the weight or measure of goods sold should also be an offence, but apart from these matters, their specific recommendations were limited to suggesting that tea, coffee, and cocoa powder should be required to be sold by net weight only. Their Report makes it clear that they only made this recommendation with reluctance and in suggesting that inspectors of weights and measures should be empowered to make purchases and to prosecute, they expressed the view that there should be no "vexatious or unnecessary intervention by inspectors." However, it must be acknowledged that this suggestion was a clear step towards the later enlarging of the field of the inspectors' activities to include commodity control as well as instrument control.

38. The First World War prevented any action being taken on the recommendations of this Committee, but rationing and food control during the war and for some years after, resulted in some temporary controls being instituted.

39. In 1925, a Food Council [30] reported to the Board of Trade that "except as regards coal, bread and tea, no legislative enactment applicable throughout the United Kingdom exists for the specific purpose of preventing short weight and measure." The terms of reference of this Council were different from those of the 1914 Select Committee. They were asked to consider and advise what measures, if any, should be taken for preventing short weight and measure in the retail sale of articles of food and drink of general consumption, including milk and bread. They made many recommendations and the Sale of Food (Weights and Measures) Act, 1926 [31] was the direct result of their work.

40. The Act does not go as far as the Council recommended, however, particularly insofar as wholesale dealings are concerned and its main provisions are as follows:

(a) short weight, measure, or number in the sale of any article of food and any misrepresentation as to weight, measure, or number in connection with the sale, exposure or offer of any article of food for sale are made offences;

(b) certain articles of food are required to be sold by net weight and in certain well-differentiated quantities only, while others are required to be sold in similar quantities but are permitted to be sold inclusive of the weight of their wrappers or containers provided these do not exceed certain specified maxima, and where they are pre-packed they are required to be marked with an indication of the minimum net weight or measure of their contents;

(c) meat is required to be sold by net weight only;

(d) bread is required to be sold by net weight only and loaves are required to be one pound or an integral number of pounds in weight only;

(e) milk is required to be sold in quantities of $\frac{1}{2}$ pint and multiples of $\frac{1}{2}$ pint;

(f) the Board of Trade are given power to make regulations requiring articles of food other than those mentioned in the Act to be sold by net weight and in specified amounts only and to be marked with their contents; and

(g) safeguards and defences to traders to take account of such things as acts by third parties, evaporation, bona fide mistakes and so on are included.

41. Except insofar as pre-packed articles, i. e. articles "packed or made up in advance ready for retail sale in a wrapper or container" are concerned, the application of the Act is limited to retail dealings. The Act is, moreover, declared to be construed as one with the previous Acts back to 1878, and this factor has resulted in one of the most important decisions of the Courts. Finally, partition of Ireland with the creation of separate Governments in Eire and in Northern Ireland having taken place since the last previous Act was passed, we have for the first time, a Weights and Measures Act passed by the Mother Parliament, made non-applicable to Northern Ireland.

42. An attempt was made in the 1930's to get a Committee established to review the law relating to weights and measures. It was contended that as the basic Act was then over fifty years old and as seven further Acts of Parliament and innumerable Orders and Regulations had come into force in the meantime, it was high time the law was consolidated and brought up-to-date. The attempt was unsuccessful; but a Bill was introduced into Parliament in 1935 to regulate the construction of milk bottles (which were being used, unstamped, as measures of capacity) and to control sales of sand and ballast in which, it was alleged, fraud was common. For reasons which it is unnecessary to enter into here, this Bill was withdrawn, but one year later the provisions relating to sand and ballast which it contained were again introduced and eventually became the Weights and Measures Act, 1936 [32].

43. The only points in this Act to which I need refer are the establishment of the cubic yard as a measure of solid extension and the limitation of the use of cubic yard measures to transactions and commodities covered by the Act.

44. The next change of importance occurred in 1944. Shortage of food and the use of substitutes during the Second World War made further protection of the public vitally necessary and accordingly, the then Ministry of Food, under their wartime powers, brought out their first "Labelling of Food Order" [33]. This Order required all wrappers and containers of pre-packed food to be labelled with:

(a) the name and address of the packer;

(b) the minimum net weight or measure of the contents;

(c) the names of the ingredients of the food in the order of the proportion in which they were used.

45. This was a great advance on the limited provisions of the Sale of Food (Weights and Measures) Act, 1926. But since the Order referred mainly to matters which were not the concern of inspectors of weights and measures, the weight and measure provisions were divorced from the other requirements in 1950 and were incorporated in a Pre-Packed Food (Weights and Measures : Marking) Order [34]. This Order, amended in some respects, is still in operation.

The Latest Review of the Legislation

46. In jumping forward to the events of 1950, I have passed over what was perhaps the most important event in the history of weights and measures control in the United Kingdom for a number of years. I refer to the setting up in 1948 of a Committee [35] (later known by the name of its Chairman, the late Sir Edward Hodgson, K. B. E., C. B., as the Hodgson Committee) whose terms of reference were "to review the existing weights and measures legislation, and other legislation containing provisions affecting weights and measures and the administration thereof, and to make recommendations for bringing these into line with present day requirements." This Committee, which was set up by the Board of Trade, included among its members, men with experience in wholesaling, retailing, scale manufacture, local government, central government and metrology, together with two housewives. They sat for two years and their Report was published in May 1951.

47. It is a tribute to the work of the earlier legislators that in the opening paragraphs of their Report, this Committee were able to say that the main conclusion to which their enquiry had led them was that "the existing principles of weights and measures law are soundly based and stand in no need of fundamental revision. Its provisions appear to have provided, within the field they purport to cover, a reasonable protection to all engaged in trade, without inflicting any unduly burdensome requirements: and the machinery of administration seems to have worked well over the years." Nevertheless, the Committee made fifty major recommendations, mostly representing additions to or simplifications of the existing framework. The chief of these were as follows:

(a) the imperial system of measurement should be abolished in favour of the complete adoption of the metric system over a period of about twenty years;

(b) whether the long term proposal in (a) is accepted or not, the imperial yard should be defined as 0.9144 of the international metre exactly and the imperial pound as either 0.453 592 37 or 0.453 592 3 of the international kilogram exactly;

(c) the apothecaries, troy and pennyweight systems of measurement should be abolished after five years, the trades and professions at present using them, adopting the metric system in their place;

(d) a number of additional foodstuffs and certain commodities other than food should be required to be sold by weight only and when pre-packed, to be made up in specified weights only;

(e) minimum filled weight standards of solid content should be prescribed for canned fruit and vegetables;

(f) special measures should be taken to control the sale of fish, chocolate and sugar confectionery, fresh fruit and vegetables, alcoholic liquor, knitting wool, thread and similar articles, paint, tobacco, liquid fuel and lubricating oil, none of which is at present subject to particular weights and measures requirements;

(g) requirements to sell particular commodities by weight, measure or number should apply to transaction at all stages of distribution, both wholesale and retail, the nature of the methods of enforcement being adjusted to the circumstances of each case;

(h) enforcement should be the responsibility of the larger local authorities and the Board of Trade should bear the ultimate responsibility for ensuring efficiency of enforcement and for this purpose should employ travelling supervisory officers; and

(i) maximum penalties should be increased.

48. No legislation has yet been introduced into Parliament to give effect to these recommendations, but the President of the Board of Trade has announced in Parliament [36] that "Her Majesty's Government are not prepared to proceed with the recommendation for the eventual abandonment of the Imperial for the metric system of weights and measures." Intensive consultation has been going on with the trading and other organisations likely to be affected by the other recommendations, but what form any new legislation may take and when that legislation will appear on the Statute Book of the United Kingdom I cannot, of course, predict.

Summary

49. The reference to the possibility of new legislation brings my survey of the development of weights and measures control in the United Kingdom to a close. It has shown that the general pattern of control has been to entrust the overall administration of the law to a Department of Central Government, and the enforcement of it to the local authorities. Until thirty years ago, the law was mainly directed toward control of the weights, the measures, the weighing instruments and the measuring instruments used in trade, but latterly there has been a marked emphasis on commodity control, without any relaxation of the machinery control. With the development of more and more prepackaging and the advent of the self-service store, it may well be that the trend of the future will be toward even more commodity control but with a lessening of machinery control.

References

[1] An act for ascertaining and establishing Uniformity of Weights and Measures.	5 Geo. 4, c. 74.
[2] The First, Second, and Third Reports of the Commissioners appointed to consider the subject of Weights and Measures.	6 Geo. 4, c. 12.
[3] An Act to prolong the Time of Commencement of an Act of the last Session of Parliament, for ascertaining and establishing Uniformity of Weights and Measures, and to amend the said Act.	4 & 5 Will. 4, c. 49.
[4] An Act to amend and render more effectual Two Acts of the Fifth and Sixth Years of the Reign of His late Majesty King George the Fourth, relating to Weights and Measures.	3 Geo. 4, c. 106.
[5] An Act to repeal the Acts now in force relating to Bread to be sold in the City of London and the Liberties thereof, and within the weekly Bills of Mortality, and ten miles of the Royal Exchange; and to provide other regulations for the Making and Sale of Bread and preventing the Adulteration of Meal, Flour and Bread, within the limits aforesaid.	6 & 7 Will. 4, c. 37.
[6] The Bread Act, 1836.	5 & 6 Will. 4, c. 63.
[7] Law Reports 4 Queen's Bench 562.	
[8] An Act to repeal an Act of the Fourth and Fifth Year of His present Majesty relating to Weights and Measures, and to make other Provisions instead thereof.	

[9] An Act for the Establishment of County and District Constables by the Authority of Justices of the Peace.	2 & 3 Vict., c. 93.
[10] An Act to amend the Act for the Establishment of County and District Constables.	3 & 4 Vict., c. 88.
[11] Report of the Commissioners appointed to consider the steps to be taken for Restoration of the Standards of Weight and Measure.	
[12] An Act for legalising and preserving the restored Standards of Weight and Measure.	18 & 19 Vict., c. 72.
[13] An Act for regulating Measures used in Sales of Gas.	22 & 23 Vict., c. 66.
[14] The Gas Act, 1948.	11 & 12 Geo. 6, c. 67.
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[18] The First, Second, Third, Fourth, and Fifth Reports of the Commissioners appointed to inquire into the Condition of the Exchequer (now Board of Trade) Standards.	
[19] Weights and Measures Act, 1878.	41 & 42 Vict., c. 49.
[20] Weights and Measures Act, 1889.	52 & 53 Vict., c. 21.
[21] Weights and Measures (Metric System) Act, 1897.	60 & 61 Vict., c. 46.
[22] Weights and Measures Act, 1904.	4 Edw. 7, c. 28.
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[26] Measuring Instruments (Liquid Fuel and Lubricating Oil) Regulations, 1929.	S. R. & O. 1921, No. 942.
[27] The Weights and Measures (Sand and Ballast) Regulations, 1938.	S. R. & O. 1929, No. 183.
[28] Weights and Measures (Amendment No. 4) Regulations, 1942.	S. R. & O. 1938, No. 236.
[29] Report from the Select Committee on Short Weight.	S. R. & O. 1942, No. 1278.
[30] Report by the Food Council to the President of the Board of Trade on Short Weight and Measure in the sale of Foodstuffs.	H. C. 359 of Session 1914.
[31] Sale of Food (Weights and Measures) Act, 1926.	
[32] Weights and Measures Act, 1936.	Cmd. 2591.
[33] Labelling of Food Order, 1944.	
[34] Pre-Packed Food (Weights and Measures: Marketing) Order, 1950.	16 & 17 Geo. 5, c. 63.
[35] Report of the Committee on Weights and Measures Legislation.	26 Geo. 5 and 1 Edw. 8, c. 38.
[36] Hansard, Volume 507, No. 6.	S. R. & O. 1944, No. 738.
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	Cmd. 8219.

DISCUSSION ON FOREGOING PAPER

MR. BUSSEY: Thank you, Mr. Poppy, for that excellent paper, which we know represents a lot of work. I know that during your stay in the United States you have had the privilege of attending a State Weights and Measures Conference in New Hampshire and that you have visited the Weights and Measures Departments in Indiana, in Boston, and in Chicago. You also have visited the factories of several manufacturers of weighing and measuring devices. I would like to start this question and answer period with a double question. First, what have you observed in this country in connection with weights and measures administration that is at greatest variance with that in Great

Britain, and, secondly, what have you observed here that strikes you as being closest to your methods of operation?

MR. POPPY: That is not an easy question to answer since there are so many things in this country that vary from our practice in the United Kingdom, and yet so many that are similar. I think perhaps where we vary most from you is in the training and appointment of inspectors of weights and measures. Secondly, I think we differ in our type approval, which is done by the central government and to which inspectors all over the country must conform. I am sure that that is of great benefit to the manufacturers of weighing and measuring appliances in my country.

Where we are closest, I would say, is in the actual methods of testing the weighing and measuring instruments in the country. I do not say the tolerances are the same, although in many cases they are not far apart, but the actual tests which are employed are very similar in my country and in yours.

MR. LIRIO: I have often wondered what became of the English 14-ounce Imperial quart that was exported to the United States, and also the 32-ounce quart.

MR. POPPY: Both of those measures have ceased to exist in our country. We have a gallon based on weight under prescribed conditions. There are 4 quarts to the gallon. Our gallon is in relation to yours approximately as 6 is to 5. There is no legal definition of our gallon in terms of cubic inches, but the best experimental value is 277.42 cubic inches.

MR. JACKSON: I was interested in your comments regarding the package-weighing program. Would you care to make any comparison between the packaging in England and in this country?

MR. POPPY: As in some other things, England is behind the United States in prepackaging. One of the reasons for my coming to your country was to learn about the difficulties you have encountered here and thus try and avoid them when we make our legislation over there. Prepackaging of a number of items of food is only just beginning in my country. That applies particularly to fresh fruits and vegetables. I have been most interested to see the amount of prepackaging of fruits and vegetables that goes on over here. Prepackaging of meat also is only just beginning in my country and we have only just begun to see the self-service store and the supermarket.

Our present legislation does not control any prepackaged articles other than foodstuffs, but we are now considering whether or not we should extend the field of control to some nonfood commodities.

MR. BAUCOM: I would like to ask if I understood you correctly to say that you were requiring your packages to be marked with the *minimum* net weight?

MR. POPPY: That is right. Not with the net weight.

QUESTION: Mr. Poppy, I think you told us that the Act of 1835 established or created a fee system for verification of standards. That provision was repealed in 1866 or somewhere along there. Then you talked about rewriting all of the weights and measures provisions later on, somewhere in 1870. Does the fee system still prevail in the United Kingdom?

MR. POPPY: Yes, and this is another point of difference between our 2 countries. With few exceptions, weighing and measuring instruments and weights and measures must be verified before being put into

use in the shops. A fee has to be paid for verification. When the appliances are in use in the shops, inspectors go around and inspect them for maintenance of accuracy. For such testing there is no fee; if the instrument is accurate within the tolerances it can be used indefinitely without further fee. As soon as it becomes inaccurate, it has to be put right, and then it has to be reverified. For this, another fee is charged. The Board of Trade also charge fees to the local authorities for verifying their standards and for the examination of new patterns for weighing and measuring instruments, and for the examination of candidates for the Board of Trade examination for Inspectorships of Weights and Measures.

MR. LEVY: It is my understanding that one of the Acts of Parliament, around 1826 or so, made an attempt to standardize weights, and that tea, coffee, and cocoa would be sold only in certain weights. Later, a variation was made from one pound to 14 ounces. That was a much-discussed question at this Conference some years back. Do you have a program to advance standardization of sizes of packaged foods?

The second question I want to ask you is this. Late in the nineteenth century, Parliament said there should be enforcement of laws covering short weight. In your enforcement must you prove intent, or is the mere fact that there was a shortage sufficient to prove a violation of the law?

MR. POPPY: In the first place our law requires certain foodstuffs—a fair number of them—to be sold in certain prescribed weights only—butter, sugar, margarine, tea, coffee, cocoa, dried fruits, for example. The prescribed weights are well differentiated so as to enable the prospective purchaser to see whether one package is bigger than the other. They can distinguish between a 1-pound package and a three-quarters of a pound, whereas they could not distinguish by eye between 16 ounces and 15 ounces. But we recognize that this principle of requiring sales by prescribed weights only is in contradiction of the principle of standardized rigid containers. We do not wish to interfere with programs for the standardization of rigid containers, although we have no specific program of standardization of such containers ourselves.

On your second question, some of our laws make wilful fraud an offense. That, as you will appreciate, means that intent must be proved. On the other hand, other laws, short weight for example, do not require proof of intent.

MR. SANDERS: I have two questions. The first question was touched on by Mr. Jackson of Wisconsin, relating to package weights. I would like to inquire as to what you see ahead in the enforcement of package weights—that is, the accuracy of weights on packages on the shelves. The second question I have relates to the extent to which you go in controlling weighing and measuring devices—for example, scales. Do you control all scales such as household, and what we term industrial-type scales—that is, those used internally within a plant?

MR. POPPY: On package weights, except insofar as the Hodgson Committee made some recommendations that short weight or measure should be an offense at any stage of distribution, wholesale as well as retail, we have no specific plans for control. The Committee did make 1 or 2 recommendations that in certain cases packages should be marked with an indication of their weight, but I must reiterate that whatever

goes into our law will be a matter for Parliament. I can only tell you what the Committee has recommended.

On the extent of control, we do not control household scales and we do not control industrial scales. We are concerned solely with weighing and measuring instruments which are in use for trade.

MR. CRAWFORD: What variation do you allow in degree of error in packing commodities, if any?

MR. POPPY: The best thing I can do here, I think, is to read you the appropriate section of the law. We have no tolerances on packages. The law gives a direction to the Courts. That is where the ultimate decision as to whether short weight is a serious matter or not, lies.

MR. CRAWFORD: Do the Courts in Great Britain recognize variation where the entire quantity might meet the stipulated weight? Do they allow for variation in the packages?

MR. POPPY: The section of the Act reads as follows: "In any proceedings under this Act in respect of an alleged deficiency of weight or measure of any prepacked article or of bread, the Court shall disregard any inconsiderable variation in the weight or measure of a single article and shall have regard to the average weight or measure of a reasonable number of other articles of the same kind (if any) sold or delivered by the defendant or in his possession for the purpose of sale or delivery on the same occasion and generally to all circumstances of the case."

MR. R. E. MEEK: I have a question concerning the training of inspectors. In our largest jurisdictions, both State and city, I believe it is customary for a new inspector to serve a trainee classification for a year or so before being promoted. In your training program, do you have something similar to that, or are there schools in Great Britain that conduct courses where a prospective inspector could take some preliminary training?

MR. POPPY: Until comparatively recently, the training of young men as inspectors of weights and measures was, to a very large extent, in the hands of the individual qualified inspectors. There were (and still are) some colleges that ran correspondence courses on the theoretical side of the job, but the practical training was in the weights and measures offices. More recently, the Institute of Weights and Measures Administration has instituted a training program which we in the Board of Trade have been happy to recognize. When a young man comes up for the Board of Trade examination and produces evidence that he has been through the Institute's course of training and has obtained their certificate, then we excuse him from certain of the subjects of our examination.

Normally, a young man needs at least 3 years in a weights and measures department before he stands any chance of getting through the Board of Trade examination. In the office he is helped by the qualified inspectors. He is taken with them when they go on inspection duties. He is allowed to do some of the testing under supervision in the office. In fact, he is given every possible job and is encouraged in every way. I think I am correct in saying that that applies to the great majority of the inspectors. They go out of their way to train these youngsters as their successors. When a trainee thinks he is qualified, he comes up for the Board of Trade examination. If he passes he is given a certificate of qualification which entitles him to apply for a job anywhere in England, Scotland, Wales, or in some

of the Commonwealth countries. When he gets one of these jobs, he is in the position of what we call an "additional inspector." He is, in fact, in the lowest position, but he has a real opportunity—depending on his ability and on what sort of a man he proves himself to be—of becoming a district inspector of weights and measures, perhaps a deputy chief inspector of weights and measures, or even a chief inspector of weights and measures.

The law recognizes only one class of inspector, i. e., an inspector who has been certified as having sufficient practical knowledge for the proper performance of the duties of an inspector of weights and measures. The other categories, district inspector, chief inspector, etc., have been created by the local authorities themselves, and a young man has the opportunity of rising to the top.

MR. BAUCOM: I would like to pose a hypothetical case of where a housewife makes a short-weight purchase and your inspector finds that it weighed correctly on the scale where it was sold to her, but on further inspection finds that the scale was out of balance. Whom do you prosecute, the clerk or the owner of the scale?

MR. POPPY: I think it depends upon the facts of the case. You say a housewife gets an article which is short weight. Presumably she has checked it and has also asked the inspector to check it. If he does find it to be deficient he would normally go to the shop where it was purchased and test the scales there. If he found that the scales were inaccurate, he would probably prosecute the owner of the shop.

MR. BAUCOM: Our inspector goes in and we get the package from the housewife and we may find that on that particular scale 15 ounces was a pound. The clerk may not know anything about it, but the owner or the operator of the store may have deliberately put the scale out of balance so that he is selling 15-ounce pounds. Who is guilty—the clerk or the owner of the scale? How would you go about prosecuting the proper party?

MR. POPPY: Under our law, the owner of the shop is responsible for the actions of his employee. He would be the man prosecuted.

MR. CICHOWICZ: Mr. Poppy, you expressed interest in one of our computing scales. I am wondering whether in England you have any computing scales and how they work. Can you tell us something about them?

MR. POPPY: The scale that I referred to was the new Hobart pre-packaging scale, which I believe was exhibited at last year's Conference. We have price-computing weighing machines in my country but none similar to the Hobart machine. The patterns of price-computing machines which have been approved by the Board of Trade are counter machines which have price graduations on the side visible to the seller but not on that visible to the customer. We impose this limitation because we consider that this type of price-computing chart would be confusing to the housewife. There has been a demand in my country for a machine which will show not only the weight on the customer's side, but also the price per pound and the total price of the article being weighed. That is up to the scale makers. If they can produce a pattern, and it is approved, that will be all to the good. It may be that we will have that sort of machine some day, but it must be clear and absolutely unambiguous. It would not be possible however to require the use of such a machine by traders.

MR. SCHEURER: Mr. Poppy, you have mentioned the Butcher's stone of 8 pounds and also the 14-pound stone.

MR. POPPY: We no longer use the Butcher's stone. The 14-pound stone is the only legal stone.

QUESTION: Mr. Poppy, I noticed in your paper you did not discuss whether a centralized system of weights and measures is more advantageous than some other system. I think by the same token we are not in a position to editorialize, either. I just wondered whether you might have some observations on it after being in this country. I noticed you indicated that legislative changes in a centralized system come pretty slowly. Do you have any other comment on a centralized system versus our State, county, and city system?

MR. POPPY: I do think that a certain amount of central control with an obligation on the inspectors throughout the country has a lot of advantages. One thing that impresses a visitor very much indeed when he looks at your system over here of the Federal Government advising and the various States making their own laws, is how you ever get uniformity. The fact that you do, is of great credit to everyone concerned.

MR. SPINKS: A fertilizer plant, flour mill, or feed mill might be putting out packages of 10, 25, 50, or 100 pounds for sale. These packages will be marked with their net weight, and they are shipped to a commercial buyer. Would you insist on the scale that the package was weighed on at the packer's plant being inspected before it is put in use, or would the package which is shipped be checked for accuracy?

MR. POPPY: I think you are referring to what we call an automatic machine, that is one which incorporates automatic devices controlling the feed, the delivery, and so on. In my country, such machines come within the category of being used in trade and are, therefore, tested by the weights and measures officials. The law prescribes alternative tests, namely a test by the use of standard weights or a check of the weight of a certain number of articles packed by the machine. The machines have to be accurate within a certain tolerance for the particular commodity being weighed, whether it is a foodstuff or a non-foodstuff. Additionally, in the case of prepackaged articles of food, inspectors check the weight of packs in the shops.

MR. SPINKS: In other words, you check the scale and then you check the packages.

MR. POPPY: Yes, and one does wonder whether we are not doing some unnecessary duplication. It is one of the problems we are considering.

MR. SPINKS: There has always been a question in my mind whether you should assume the double duty of checking the scale and then the package. Some people think you have no business going back in the factory and checking the scales, but, to protect the employees of a company which owns a lot of scales, maybe you need to verify the accuracy of that scale and see whether the employee is turning out a bad package purposely, or the scale may be doing it without his knowing it.

MR. POPPY: Take a machine which prepacks 1-pound packages of sugar for instance. We have something like 800 qualified weights and measures inspectors in our country who are all entitled to go in to the shops and weigh any number of packages of sugar they wish. The first thing they normally do when they find short weight is to get in

touch with the inspector where the sugar is packed and inquire what he knows about the firm's production methods and what might have happened to cause this short weight. What they learn from their colleague has a material effect on their decision whether or not to go ahead and prosecute.

MR. BOWEN: Mr. Poppy, perhaps my question is because of a difference in national terminology. I believe you said that your jurisdiction is over scales used in trade and does not include industrial scales. Here we are interested in scales that we refer to as being in commercial usage. In other words, it is a scale used to determine the weight upon which some money transaction is based. For instance, in factories we come across a number of counting scales to be used for counting piece-work. Would such a scale in England come within your jurisdiction? It is an industrial scale.

MR. POPPY: You are quite right; it is a case of a slight difference in the terms used in our respective countries. We are actually doing the same as you. The counting machine that you mentioned would come within the jurisdiction of weights and measures law. "Use in trade" means any machine which is the basis of a transaction on which payment in money or something else depends. An example of the industrial machine is a machine where the firm puts certain proportions of different ingredients together to make up a product, the product itself being finally sold over another machine. It is the last machine that we are concerned with. We are not concerned with the mixing scale at all.

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 5, 1957

(R. K. SLOUGH, VICE PRESIDENT, PRESIDING)

REPORT OF THE COMMITTEE ON EDUCATION, PRESENTED BY T. C. HARRIS, JR., CHAIRMAN

Your Committee on Education wishes it were possible to present to you specific suggestions which, if adopted, might offer solutions for the major problems facing weights and measures officials today. Obviously, such is not possible. In fact, while we are here in Washington trying to find answers to some of our problems, new ones are being created back home.

In reviewing reports of previous National Conferences on Weights and Measures, your Committee finds that officials face many of the same problems today as existed 15 years ago. In many instances, solutions are not yet in sight. Some of the problems are local in character and cannot be solved here at the National Conference by any of the Conference committees or the Conference body.

During the National Conference, weights and measures officials will participate in a program designed to help us solve our problems back home, and to promote weights and measures throughout this country. The officers and committee members have worked long and hard to bring you the program you want. The speakers are outstanding leaders in their fields. The combined knowledge of those in attendance at this meeting is equal to any group ever assembled to discuss any subject.

Your Committee is deeply concerned about poor attendance during the business sessions and lack of participation in the discussions of the National Conference on Weights and Measures. The Conference must receive your wholehearted support or its purpose is defeated. We must give the Conference our united and enthusiastic support. This is our Conference; we must be proud of it and support it with our attendance and active participation.

Your Committee is aware of the fact that the National Conference does not and cannot cover all subjects, nor solve all problems. The desired results can be obtained only if we return home with the knowledge gained here, fired with enthusiasm and determination to improve the weights and measures program in our own jurisdiction. In this way only can we make a major contribution to a national program.

It has been said many times that the weights and measures profession is only as strong as the men who enforce its laws, rules, and regulations. If this is true, then how strong is our profession today? How strong should it be to render adequate service to our people? Your Committee believes that if we answer honestly and frankly, we could not express complete satisfaction. Do we really have enough dedicated men in our organization? Men with integrity and ability who add

dignity to our profession? Men with determination, who can plan, direct, and promote a weights and measures program that the people of any jurisdiction would have confidence in and be justly proud of? Men who are keenly aware of their responsibility as weights and measures officials and willing to accept that responsibility?

Let us be honest with ourselves. The formidable obstacles that confront many weights and measures officials today probably were fostered by the officials themselves. In many jurisdictions it is believed that additional personnel, higher salaries, and new equipment would solve most of the problems. In many instances this is true. In certain other cases, additional personnel, higher salaries, and new equipment would only add to the existing confusion. Confusion caused by poor administration of a weights and measures program. Insufficient personnel, low salaries, old and obsolete equipment, low morale, and poor public relations are but by-products of poor administration. These will result in loss of confidence and public support and acceptance.

In most cases, the person who must be held responsible for any such deplorable condition is the chief administrative officer. In order to progress, a weights and measures program requires a great deal of planning and directing on the part of the head man. In planning a program, the objectives must be determined and ways found to reach these objectives. The director of a weights and measures program cannot escape his responsibility. Webster defines responsibility as "a charge for which one is accountable." As a public servant, are you willing to be held accountable for your program?

Your Committee on Education feels that there is not a problem facing weights and measures officials today that cannot be solved by the officials themselves. To prepare for such solutions, we must answer some very frank questions as honestly and intelligently as we know how. Are we qualified to do the work? Do we have complete command of proper testing and inspection procedures for all types of equipment? Do we have complete knowledge and understanding of the laws we are to enforce? Is there a sincere desire to serve? Do we command respect in places of business? Does the consumer have confidence in our work? Does our conduct add dignity to our program? Are we willing to work hard? Finally, do we know our objectives?

Your Committee on Education has discussed at length, and in detail, some of the many problems facing weights and measures officials today. It is the belief of your Committee that poor planning and directing and inadequately trained personnel are the basis for many of these problems.

Your Committee has consistently emphasized the importance of more and better educational activities for weights and measures officials. A half-trained official is a dangerous person to have in the field to enforce laws, perform inspections, and maintain good public relations. He is very frequently embarrassed by his inability to handle problems.

No businessman would think of sending an inexperienced salesman into the field to sell his product. Salesmen must have complete knowledge of the product, sales promotion techniques, and company policies. The service we are selling today is equal to any manufactured product on the market. We too must have expert salesmen in

the field. They must be equipped with a complete knowledge of the laws, rules, regulations, and correct testing and inspecting procedures. They must know what the Department's policies are and be thoroughly trained in public relations. As surely as we have this type of inspector in the field performing this essential service, salaries will be adjusted, additional personnel provided, and old, obsolete equipment replaced. We will have reached our objectives and achieved professional status in our work.

To help reach these objectives in the shortest possible time, your Education Committee recommends for your consideration the following:

- (1) That extreme care be exercised in planning the program.
- (2) That Handbook 44 be adopted as the official specifications, tolerances, and regulations for commercial weighing and measuring devices, and that *all* provisions of Handbook 44 be enforced.

(3) That extreme care be exercised in selecting new personnel. (A large number of inspectors, improperly trained, is not the answer. A smaller, efficient and well trained force following a carefully planned program will do much more to increase weights and measures effectiveness.)

(4) That annual training schools be established in every State to include courses in the legal requirements, testing and inspecting procedures, investigation methods, evidence gathering and presentation, public relations, and other appropriate subjects.

(5) That all laws, rules and regulations, and department policies be reviewed and brought up to date with the Model laws and regulations.

Your Committee recommends that this Conference go on record as requesting the National Bureau of Standards to consider the possibility of establishing a training school at the Bureau or some other convenient place. The purpose of this school would be to instruct weights and measures administrators in the proper testing, inspecting, package checkweighing, and enforcement procedures. Such a school should have short courses in public relations and general weights and measures administration.

If such a school is established, your Committee recommends that all large weights and measures jurisdictions give it their support by sending at least the chief administrative officer or his assistant to this school. These men should then be thoroughly qualified to instruct and train new personnel at local training schools.

Your Committee suggests that for local training schools, more could be accomplished if the training of field personnel were done in the laboratory. Any jurisdiction can borrow or rent, for a small fee, such equipment as a gasoline pump, kerosene dispenser, computing scales, counter scales, platform scales, fabric measuring devices, taximeters, and the like. Such equipment could be used in the laboratory very effectively in operation and testing demonstrations for new inspectors. Here the devices could be examined closely and discussed in detail. Application of the requirements of Handbook 44 to a particular device could be discussed in detail without causing embarrassment to the new employee.

Your Committee further suggests that the various State departments of education could be used quite effectively. Such departments have short courses in public relations, management, and other appropriate subjects. Such short courses could be a part of weights and measures training schools.

Your Education Committee realizes that all efforts to assist a jurisdiction to improve its program are defeated unless there is a sincere desire on the part of the officials to improve.

It is our hope that the suggestions advanced here will receive whole-hearted support.

(The report of the Committee on Education was adopted by the Conference.)

A CENTRAL PROGRAMME FOR WEIGHTS AND MEASURES IN CANADA

BY R. W. MACLEAN, *Director, Standards Division, Department of Trade and Commerce, Ottawa, Canada*

When I had the pleasure of addressing this Conference in 1951, I gave a general outline of the activities of weights and measures in Canada. Those of you who were present, or later had an opportunity of reading my remarks, will recall that I pointed out what I considered to be the fundamental policies underlying any weights and measures administration. In this connection, it was my view that the primary requirements were the establishment and maintenance of basic standards of length and mass, and the assurance that working and derived standards were continually reverified to ascertain the continuing limits of accuracy. Without adherence to these basic fundamentals, commercial operations would be based on pretty shaky foundations. The requirements are not becoming any less. In fact, those charged with the maintenance of standards and their translation to commercial use are being called on to meet finer and finer limits of accuracy. You will perhaps recall a reference to this in the Report of the Committee on Weights and Measures Legislation to the United Kingdom Parliament in May 1951. Dealing with the difference between the British and U. S. yard, the Report states:

These discrepancies in values, although extremely small, are unsatisfactory by any scientific criterion; and they have, moreover, begun to impinge on certain important aspects of international trade. Within recent years, technical accuracy in the manufacture of standard reference gauges which are used in precision tool and inspection rooms, has so increased that values standardised to one part in a million are not uncommonly called for, with the result that gauges conforming to a particular specification in the U. S. A. would not conform to the same specification in Great Britain, and vice versa. It is of the essence of a standard that its definition shall be more precise than the most exacting practical demand made upon it.

I think it goes without saying that in any organized community it is fundamental that a yard be the same length as every other yard, and that a pound in use in areas on the Atlantic Coast be the same as one on the Pacific Coast. If this were not so, commercial interchange would soon be confusion confounded. If trade, internal and external, is to function, there must be fundamental norms which mean what they say so that they can be accepted and used as such, or be converted into others in use in other countries by a predetermined relationship.

The title for my remarks today is "A Central Programme for Weights and Measures Standards in Canada." In developing this theme, may I be permitted to go back a little way into history to indicate our beginnings in this field and carry through to our present day situation?

As far as Canadian units and standards are concerned, history may be divided into our four phases.

First, before Confederation in 1867, the Provinces of Canada had copies of British Standards. These did not include metric standards

because Britain did not join the Metric Convention until 1884. It might be of interest to note that the present British standards were constructed in 1855 and copies were sent to various countries throughout the world, including the United States and Canada. For example, the United States received bronze yard #11 which it officially adopted as a standard, and Canada bronze yard #16 which was the standard in Canada until 1874.

In the 1860's the Provinces of Upper and Lower Canada, Nova Scotia, and New Brunswick, formulated and agreed upon a basis of union. The terms of union were set out in the British-North America Act of 1867, which defined the division of legislative powers between the provincial and federal authorities. The powers of the Federal Government were included in Section 91, which gave it the right to make laws for the peace, order, and good government of Canada in relation to all matters not coming within the classes of subjects assigned exclusively to the provinces and, for greater certainty, the exclusive legislative authority over all matters within a specified class of subjects. Amongst these classes were "weights and measures." The Act, therefore, established weights and measures in all aspects as a matter of federal jurisdiction. As I indicated to you in 1951, this appears to have many distinct advantages. The most important, of course, are that throughout the Dominion of Canada there is only one set of fundamental standards, one organization which maintains these and provides for their translation to the commercial level, one central body which approves the types of equipment which may be used for trade purposes, and, by and large, one set of inspection procedures from the Atlantic to the Pacific.

Second, following Confederation, new Canadian standards were obtained in 1874. This was in accordance with the Weights and Measures Act of 1873 which, at the same time, legalized metric units. It should be noted that these were strictly Canadian standards and no cognizance was taken of possible drift from the British Imperial standards which might occur if the standards of either country changed.

Third, in 1914 the International metric units were established as the basic units for the metric system in Canada. This slightly changed the previous legal relationship between the metre and the Canadian yard.

Finally, in 1951, the Canadian Parliament passed an Act entitled "An Act respecting Units of Length and Mass." It is very short and I should like to read it :

The units of length and mass for Canada are based upon the International metre and the International kilogramme established in the year 1889 by the first International Conference of Weights and Measures and deposited at the International Bureau of Weights and Measures.

The standard unit of length for Canada is the yard, which is nine thousand, one hundred and forty-four ten-thousandths of the International metre.

The standard unit of mass for Canada is the pound, which is forty-five million, three hundred and fifty-nine thousand, two hundred and forty-three one-hundred-millionths of the International kilogramme.

The National Research Council shall maintain standards of length and mass calibrated in terms of the units defined in this Act.

Reference standards for the purposes of the Weights and Measures Act shall be certified by the National Research Council as having been calibrated in terms of the units defined in this Act.

In short, this defined the pound and yard in terms of the kilogramme and metre and charged the National Research Council with respon-

sibility for maintaining these standards, and for providing reference standards to the weights and measures organization. In the same year, a new Weights and Measures Act was passed which tied the Weights and Measures Administration to the new units and standards, listed subsidiary legal units and standards, and brought other weights and measures matters up to date.

I apologize for quoting at length the following figures, but it appeared to me that a look at the comparative values of the basic units of length and mass in various countries in terms of the metre and the kilogramme would be of interest and perhaps of some value.

<i>Length:</i>	Canadian yard-----	0.9144 of the metre
	U. S. yard-----	.9144018
	British yard-----	.9143992
	Canadian inch-----	25.400 mm
	U. S. inch-----	25.40005 mm
	British inch-----	25.399978 mm
<i>Mass:</i>	Canadian pound-----	0.45359243 of the kilo
	U. S. pound-----	0.4535924277
	British pound (legal)-----	0.45359243

The Canadian yard was established on a ratio with the metre, which resulted in one inch equalling 25.4 mm, which is the universally recognized relation in engineering throughout the English speaking world. In addition, as indicated in the comparison I made earlier, it places the Canadian yard approximately midway between the British and American values. Further, this value was recommended for adoption throughout the British Commonwealth by the Commonwealth Science Congress of 1946, and has been endorsed by a widely representative official committee in England.

The legal pounds of the three countries are in essential agreement. I believe the United Kingdom would like to see a universal change in the pound/kilogramme ratio so as to permit it to be divisible by 7 and, therefore, to give a finite equivalent for the grain, and consequently for every other denomination of mass in the Imperial system.

Since there is very good evidence that the international metre and international kilogramme are extremely stable in representing their units, it may be stated confidently that the standards on which scientific and practical measurements now made in Canada are based are as stable as it is humanly possible to make or measure at this time. However, it is to be hoped that the long-sought natural standard of length may be soon adopted, using a light wave length in the spectrum of certain isotopes. Three elements are particularly favoured for this purpose: namely, mercury 198, krypton, and cadmium. Our National Research Council is experimenting with the first two of these. Mercury 198 might well be said to illustrate the alchemy of old in reverse, for gold is bombarded with neutrons to obtain this particular isotope of the base metal mercury.

Now for a few words about the derived units for volume and area. The Weights and Measures Act of 1951 defines as follows:

The unit or standard measure of capacity from which are derived all other Canadian measures of capacity, whether of liquids or otherwise, is the gallon, which contains ten Canadian standard pounds weight of distilled water weighed in dry air against brass weights of density 0.30346 of a pound per cubic inch with the water and air at sixty-two degrees of Fahrenheit's thermometer and the barometer at thirty inches.

This is essentially the same definition as the British except that it is somewhat more precisely stated. It gives a gallon containing 277.42 cubic inches. Oddly enough, the British still use, for determining customs and excise duties on beer, wine, and spirits, a gallon of 277.274 cubic inches, which is a throwback to the first Imperial gallon established in 1824. The figure of 277.42 which is used for all other purposes was legalized in 1878.

The differences in American and Canadian units of length barely have practical significance, but such is not the case with our capacity units. Let me compare them :

U. S. gallon-----	231 cubic inches
Canadian gallon-----	277.42 cubic inches
1 U. S. fluid ounce-----	1.04082 Canadian fl. oz.

These differences are unfortunate and they do impede the easy flow of certain goods and machines across the border. Since every device, machine, or measure used in Canadian trade must be measured and marked in Canadian units, a gasoline pump, for example, manufactured in the United States must be modified to register in Canadian units before it can hope for approval. Containers marked in American volume also run into difficulty because of this differential.

In the matter of area, our units correspond with yours except that in Quebec the old French measures are granted legal status in those parts of the Province originally granted under seignorial tenure. The relative values of the French foot, arpent, and perch are established under our Act, but these apply in territorial measurement only.

The legal multiples and fractions of the basic Canadian units are established in the Weights and Measures Act, but we approve somewhat fewer of these than the British or yourselves. To mention a few which have not received legal status : The carat, the furlong, the 14 pound British stone, the hundredweight of 112 pounds, the fluid dram, and the minim. The only nonavoirdupois weight (outside of metric) which retains any legal status is the Troy ounce, which is defined in the Act as 480 grains.

The job of seeing that measurement in trade and industry conforms to the fundamental standards is, as I pointed out, a federal responsibility in Canada, and the duty is assigned to the Standards Division of the Department of Trade and Commerce. Two of the several branches of this Division, of which I am Director, are the Weights and Measures Inspection Service, and the Standards Laboratory. It is the responsibility of the former to see that trade devices measure within specified tolerances, and it is the duty of the latter to see that the Weights and Measures Service is supplied with certified standards and other equipment so that its inspection duties may be efficiently and accurately carried out.

Between the basic Canadian units and ordinary trade measurement there are four levels or grades of standards. In decreasing order of quality and precision, they are :

1. The National Research Council standards referred to in the Length and Mass Units Act. These standards are in the custody of National Research Council and include :

- (a) a copy of the International Kilogramme obtained in 1950;
- (b) former Dominion standard metres and kilogrammes;
- (c) former Dominion standard pounds, yards, and troy ounces, and their official copies ;

(d) other standards for the purposes of making intercomparisons.

There is no established period or schedule for checking these with the International Bureau at Sevres or for making the transfer from metric to customary units. However, such intercomparisons are made whenever opportunity or circumstances permit or dictate.

2. The Reference Standards in the custody of the Standards Laboratory must, by virtue of the Weights and Measures Act, be calibrated and certified by the National Research Council at least every five years. They include:

- (a) measures of length from 100 feet down to 1 inch ;
- (b) a reference metre ;
- (c) capacity measures from a bushel to a half-gill ;
- (d) metric volumes from a double decalitre to a centilitre ;
- (e) avoirdupois weight sets from 50 pounds to $\frac{1}{2}$ dram ; from 5 pounds to .001 pound ; from 1000 grains to .01 grain ;
- (f) troy bullion weights from 500 oz. to .001 oz. ;
- (g) metric weights from 20 kilogrammes to .001 grammes.

3. (a) Laboratory Working Standards. These are in the custody of the Standards Laboratory and include a full range of measures in length, weight, and capacity. They are calibrated by the Standards Laboratory not less often than once a year.

(b) Field Reference Standards. These standards are the same quality as the Laboratory Working Standards and are calibrated to the same precision by the Laboratory on a periodic basis, the length of which period is determined by the amount of expected use and the durability of the standard. They are normally in the District Inspection Offices, of which there are twenty-one throughout Canada.

4. Local or Field Working Standards. These are the Standards actually used by the field inspector and are normally in his custody or that of his District Office. They are calibrated frequently by the Standards Laboratory and here again the period is determined by the durability of the equipment.

I should like to say a particular word about these standards which are in the hands of the field staff, for they are the ones with which the practical application of weights and measures inspection work is most closely concerned. If I may again refer to my talk to you in 1951, I said that: "You will all be familiar with the care taken in the custody of and use of primary standards, and this care should be relatively no less in the hands of an inspector. I think you will agree that mutilated test weights or measures do not inspire self-confidence in an inspector nor confidence or respect in traders for the inspector, the service he renders, or the service he represents."

In meeting these objectives, we have endeavoured to place in the hands of our inspection staff, standards that are not only accurate, but also are well maintained. We have been pointing to the development of a uniform set of standards for each inspector, together with a complete set of tools to enable him to perform adequate inspections. In addition, we make available to each district, for certain periods each year, large capacity or heavy duty standards for those fields of work for which the normal kit is not designed. I mentioned to you previously that we covered heavy duty scales in Eastern Canada with a 12-ton sealed unit. It had been our hope that we could place another of these units in Western Canada, but this has not been advanced further in view of the short inspection season and the condition of access roads which makes travel precarious. For over a year we have had in operation in Eastern Canada a large volumetric unit which is capable of testing the largest bulk meters in use today. A second is being built this year to operate in the western provinces. These units permit tests hitherto not possible, and provide a service which to date we have not been able to offer the petroleum industry. Between the

large volumetric units just mentioned and the normal 5-gallon test measure which an inspector carries with him, we have developed 50-gallon and 300-gallon trailer units which give us fairly effective coverage for the whole petroleum industry. In the past several years, we have designed a new type of stainless steel inspector's weight kit with four 5-pound weights and ten 1-pound weights, and we have also developed a new type of inspector's balance which has proved most acceptable to our field staff.

With the exception of the 50-pound standards and some of the intermediate volumetric tanks, all field or local standards are calibrated by our laboratory at specific periods; that is to say, we maintain a card index on each piece of equipment and, at such intervals as are determined by the durability of the equipment, a recalibration is done. In the intervening period, our District Offices are instructed to make periodic intercomparisons of their own equipment to ensure continuing reliability. When equipment is called in, it is subjected to examination, repair if necessary, and recalibration and refurbishing, and it is then adequately boxed. As you will be aware, such carrying cases can be of a great variety of sizes and shapes, and we have not been able to standardize any box which is suitable for all weights carried by an inspector. We have, however, been standardizing on certain ranges of weights which will give fairly uniform carrying equipment. Each inspector's balance is adjusted as necessary, and we are making real progress in providing facilities and equipment to overhaul each balance from top to bottom, including the manufacture and installation of new pivots and the replacement of bearings. We have been able to standardize a new carrying case for balances which provides for a handy fitting of the balance and accessories for ease of assembly, use, and repacking.

Each standard as repaired, recalibrated, and boxed, is provided with a certificate which indicates the tolerance in the specific piece of equipment. We, therefore, feel that our field staff is not only well equipped with standards upon which they can place every reliance, but it may also be certain that the service it is rendering to the community is of the highest order. Too, the field staff knows that it is supported by a hard working group which is doing all possible to give it such equipment and at the same time is looking to new methods and designs to facilitate field work. With the centralization of standards calibration, an inspector in one part of the country can test equipment with the reasonable assurance that, if the equipment is moved to another part of the country, any recheck will show a similar result. While it is true that, with a centralized system, day-to-day supervision and examination are not possible, yet I think the over-all benefits reach far beyond this one shortcoming.

Two of our engineers recently have visited the National Bureau of Standards. We are presently reestablishing our own Laboratory in first-rate quarters, and we shall be back again to the National Bureau to make sure we are keeping up to date on progress which is being made here. I should like to express our deep appreciation for the valuable assistance which has been given to us from time to time during the past several years by many of the State authorities with whom we have consulted. Their willingness to post us on certain developments, and their experience with certain practices have been invaluable.

IMPROVING WEIGHTS AND MEASURES ADMINISTRATION IN THE UNITED STATES

By N. E. KIRSCHBAUM, *Supervisor, Weights and Measures Section,
Division of Economic Practices, Department of Agriculture, State
of Wisconsin*

A study of the National Conference Reports reveals that a number of excellent papers have been presented on improving weights and measures administration in the United States. As a matter of fact, every paper presented since the founding of the Conference has had as its intent, and has to a greater or lesser degree, resulted in improving weights and measures administration. It is an ambitious subject, and one which at best we can only hope to cover in part.

But one of the truly great contributions of the National Conference on Weights and Measures is a free and frank exchange of facts, experiences, thoughts and ideas. We who are relatively new in this field appreciate this opportunity to "stand on the shoulders" of the pioneers in this work and do some thinking out loud. Some may disagree with portions or all of this presentation. The ideas may be old to some. But if this paper serves the purpose of arousing thought, discussion, and, most important, action, it will have made some contribution to this 42d National Conference.

Progress requires planning—planning requires objectives. We find no better description of a single broad objective for all of our efforts than the oft-quoted statement in National Bureau of Standards Handbook 26, which states in effect that the objective of any weights and measures jurisdiction is to develop and maintain accuracy and fairness in quantity determination in all commercial transactions.

What does this objective mean in terms of improving weights and measures administration? It is broad—so broad as to be meaningless unless we define it in terms of specific programs. For example, it means that we should test all mechanical devices once each year or oftener to assure mechanical accuracy. It can mean that we should check-weigh, on a periodic basis, scientifically-selected samples of all packaged commodities in our jurisdiction. It can mean that all standards should be compared, on a regular local, State, and National basis, with uniform laboratory procedures. It can mean that all mechanical devices should be given type approval before they are sold in the State. But can we carry out a thorough, effective program in all phases in every jurisdiction with the present limited funds, personnel, and equipment? We believe that in most cases the answer is "No." It becomes necessary, then, to decide whether we will attempt to do everything and do it inadequately, or give priority to those things that will insure the greatest service at the least cost. Meeting this objective means, in our opinion, doing the right things in the right way at the right time in the right amount so that taxpayers, consumers, and all buyers and sellers get the most for their public funds in helping to assure accuracy and fairness in weighing and measuring in all commerce.

A weights and measures official of one of the leading county jurisdictions in the United States introduced his paper, "Financing a Weights and Measures Organization," before the National Conference in 1947, with these words: "Two fundamental principles should govern the work of every public official: first, do a good job; second,

and equally important, let the people know what is being done for their benefit." How can we do a better job?

We are living in a package economy. Let's face it. We believe every weights and measures official represented at this Conference has long recognized the need for more effective package and commodity control. If we are realistic, we will have to agree that from 50 to 75 percent of the funds and effort of every jurisdiction should be given to this phase of the work. The most direct route to the improvement of weights and measures administration in the United States, in our opinion, is putting into actual operation a consistent year-round, scientifically sound, and intelligent commodity check-weighing program, carried on through a coordinated effort at the local, State, and National level. The course for this program has not been blueprinted. Acceptance of the necessity of this program, and experience in working on the actual problems of package weighing at all levels is the only sure-fire method of getting this show on the road. To be effective, each industry and each company within each industry must be advised in specific terms, at all levels, what is expected of them. Here we can learn much from industry, and with industry's cooperation, real progress can be made. Industries or businesses who choose not to cooperate, on the other hand, must be dealt with in a more persuasive manner that may call for extensive checkweighing, and in some cases prosecution. In this program there is need for a regular exchange of specific package-weight information among all jurisdictions, so that efforts need not be duplicated, and so that each official uses a uniform technique and is armed with a broad knowledge of the particular problems involved. If we had the proper exchange of information and a uniform package-checkweighing procedure, universally followed, and if package weights were periodically checked at the source in each and every jurisdiction in the United States, we would begin to pare this package-weight problem down to our size. We suggest that every jurisdiction give immediate consideration to a year-round package-weighing program, using, where possible, the services of the technically and mathematically apt person who can meet with top management of industry, statistically analyze data, and direct and plan the program.

Recently, we saw an article in the Federal Food and Drug Journal entitled "The Weights and Measures Jungle." If this title has any justification whatsoever, such justification lies in the lack of uniformity of laws, regulations, procedures, and programs across the country. Individuality is one of the basic human traits, but if weights and measures under our present administrative framework is to stand, this individual initiative must be guided down the same road.

Today an increasing proportion of our consumer goods is distributed and merchandised on a national scale. Realizing this, do you think that we in weights and measures, for example, are justified in asking a national manufacturer of a weighing or measuring device, or a food company putting out a new food package, to engage a full staff of attorneys, engineers, and experts, for months, or even years at a time, just to find out what the weights and measures laws, regulations, and other quantity requirements are? This is going on every day. Is this good public relations? Is it good administration? We need not dwell long on this question—the answer is obvious. The important

question is whether or not effective steps are being put into action to eliminate this "jungle." In getting at this vital problem, we should bear in mind that any law, regulation, specification, or tolerance enacted for the protection of the public should be fair to industry, should be enforceable, and should be enforced—and be enforced uniformly.

Making uniformity in weights and measures live means adoption and uniform enforcement nationally of the specifications, tolerances, and regulations found in National Bureau of Standards Handbook 44. It means revision of State laws and regulations in line with the model laws and regulations developed through this Conference. It means uniform mechanical testing procedures and package-weighing programs. This is going to require more effort and cooperation of local and State officials than we have been able to put forth so far. It means the National Conference must be strengthened and its output increased. Model specifications, tolerances, laws, and regulations should not, and must not, be adopted by State and local jurisdictions if they do not embody principles that are sound. When these principles have been embodied in model laws, regulations, and specifications, they should mean something. They should be enforced on a uniform basis by each jurisdiction.

There are those who are going to say that it cannot be done, but we are here today to say that it must be done if the present ideal framework embodying National, State, and local segments is to be continued in this country. While we recognize that there are difficulties which seem insurmountable, we believe that weights and measures uniformity is much more easily obtainable than is uniformity in almost any other similar enforcement activity of government, because this program is based upon the scientific application of known standards.

Technical developments since World War II have revolutionized the American market for buyers and sellers. In every field the job is being done by new machines and new methods. Weights and measures administration must change with it or become a fading entity on the American scene. This phenomenal technical development in marketing has been made possible through specialization. The tools of specialization must be adopted in weights and measures administration. Specialization is going to require more complex equipment, different testing procedures, and specialized training of personnel.

Discussing the direction we are going in our weights and measures program is academic unless we set up the machinery to attract, train, and maintain competent personnel to carry out these programs. Acquaintance with the complex and diverse mechanical and administrative phases of weights and measures work cannot be acquired accidentally. It must be planned and carried out over a number of years. We must attract young men and offer them a real future in terms of job satisfaction, economic opportunity, and job security. In our State, we have recommended to the Bureau of Personnel that there be 5 weights and measures specialist classifications covering a salary range for a beginning inspector of \$4,800 per annum, to \$7,800 per annum for the section supervisor. We note that the Committee on Education of the Conference has made a similar recommendation setting forth 7 grades. These are important actions if we really want to move ahead.

If we do attract young men with a potential, then their value and effectiveness will not be realized unless they are properly schooled, not

only in the basic fundamentals, but in the policies and philosophies of the work. Lack of training reflects not only upon the particular jurisdiction, but upon all weights and measures administration. Training must be stepped up, and the National Conference and the National Bureau of Standards are making, and can make, a great contribution if the training tools are put to work by State and local departments.

If we do our job well, the battle is more than half won, but the road ahead will be rocky and rough unless we have a program of letting the people know why and what is being done for their benefit. The recent Indiana State Weights and Measures Newsletter set forth a statement on publicity that expresses a good thought: "Good publicity is just as necessary to weights and measures supervision as it is to any other governmental activity. The public is entitled to know what is being accomplished, the steps being taken to protect both buyer and seller, which is the ultimate objective of those assigned this responsibility. Unless the public is given this information, it cannot be expected to support the efforts of conscientious and far-seeing weights and measures officials to build up their departments to the extent necessary to cope with all weighing and measuring problems associated with our modern machine age."

Any public information program should be based upon established facts. Care must be taken so as not to attempt to go too far and too fast. Informing the public generally is one distinct phase of the problem to be handled in the accepted forms of press releases, radio and TV programs, and other publicity. These articles should not attempt to cover technical phases of the work, but should emphasize the economic importance of it. On the other hand, articles in trade publications and other specialized media should be especially tailored for the readers of that particular group. Probably the most important group of our "public" consists of the administrators of our program, and it is here, we believe, we have fallen down. We should make every effort to understand how our superior views our work, and provide him with information so that he is (1) impressed with the need for the activity, and (2) convinced that we are capable of conducting the work in an efficient and effective manner. No miracle drugs or magic tricks will solve the publicity problem for a department, but if this department does its work effectively, and each member knows his work and his responsibilities, the department will have a real story to tell and will have little difficulty in telling the people about it.

Before concluding this paper on improving weights and measures administration in America, we would like to discuss the use of the approval seal—specifically the paper seal. The sealing concept has always been a cornerstone of weights and measures administration in America. The seal has and does serve a purpose. But as with any administrative principle, it has some disadvantages. We wonder whether its continued use is justified as we view today's realities.

To appraise the pros and cons of the sealing or approval principle, our first question is "How does its use aid us in meeting our objective?" What is the effect of the seal in improving accuracy of commercial weighing and measuring? In answer, in all fairness, we would say it is public notice that a device has been tested and found correct and accurate. But as such, don't we create a public illusion that the device is accurate as long as the seal is on the device—not just the day we tested it? It follows then that if we do not wish to leave ourselves open to a criticism of creating a sense of false security,

we should be prepared to test *all* commercial devices often enough to make the seal mean what the public assumes it means.

In our State we are not staffed or equipped to render that service, and we doubt that we ever will be. We cannot test, for example, pre-pack scales every day or every week, every month or every 6 months, which may be necessary to insure the accuracy of heavily used equipment in our mass-production age.

Being realistic, the every-day responsibility of maintaining accurate devices in today's advanced technology must rest with the operator himself and the service people he employs. The sooner we let him know that it is his full responsibility, the sooner we will meet our objective. In package commodities, for example, if we can administer a continuing, effective check-weighing program, need we ever seal his scales? The operator under such a program begins to appreciate the need for him to develop his own quantity-control program, and here we should help him.

One of our primary objections to the seal has been that we have, where we find faulty equipment, unwittingly shouldered some of the responsibility for the use of the illegal device. Our seal was on the device, for example, when we finally tested it, and may have been there for a year, during which time this scale intentionally or unintentionally defrauded the scale owner or the public. We have given the scale a degree of official recognition which is unwarranted, and, worst of all, we are at a disadvantage in considering otherwise appropriate legal action.

In recommending eliminating the seal concept we do not intend to give the impression we are de-emphasizing the need for mechanical testing. There will still be plenty to do—at the request of industry in case of packaged commodities, and by necessity in case of bulk dry and liquid commodities.

In summary, we are listing 10 objectives for each weights and measures jurisdiction to work. These, we believe, will result in a better over-all job:

- (1) Accurate standards through a strong laboratory program;
- (2) Uniform field test procedures to translate laboratory accuracy into everyday commerce;
- (3) Uniform specifications, tolerances, and regulations for mechanical equipment and mechanical testing;
- (4) Uniform package-weighing procedures, laws, and regulations;
- (5) Specialization of work where practical;
- (6) More exchange of information at local, State, and National levels;
- (7) Improved job opportunity through improved salaries and better training;
- (8) A planned year-round public-information program;
- (9) Strengthening of National Conference on Weights and Measures to bolster State and local programs through National planning;
- (10) A budget of 10¢ per capita to carry out this work.

A father once gave his little boy a jigsaw puzzle made up of a map of the United States. It was made up of thousands of small irregular pieces. In a few minutes the boy presented the completed puzzle to his amazed father. "How did you do it so fast, son?" the father asked. The boy replied, "It was easy, dad. There was a picture of a man on the back of the map. I put the man together, turned it over and the United States was together."

Like the map, our weights and measures program will not be completed unless every piece is there and is fitted into its proper place. It will be the men in weights and measures who must put the pieces together.

DISCUSSION ON FOREGOING PAPER

MR. TURNBULL: You mentioned the type of approval for weighing and measuring devices that should be required by the various jurisdictions. For the sake of uniformity do you not think that type approval should be on a national basis?

MR. KIRSCHBAUM: If Handbook 44 were adopted and enforced on a nationwide basis, I believe type approval, as such, would be unnecessary.

MR. BOWEN: With regard to the use of approval seals on weighing and measuring devices, I feel that the seal on a scale is important. If seals are not used, storekeepers would be negligent in notifying us when they put a new scale into use. Secondly, a good public relations program is imperative for the most efficient and effective weights and measures administration. The approval seal is almost indispensable in connection with the best of public relations programs.

MR. KIRSCHBAUM: If you are making inspections twice a year the seal can be effective, but in Wisconsin there are places where inspections have not been made for 3 or 4 years. The point is, is it good public relations to have an operator using a device with a 4-year-old seal on it?

MR. J. P. LEONARD: I feel that a seal put on a scale only tells the owner of the scale that, at the time of inspection, the scale was accurate. It is impossible for the official to control the mechanical condition of the scale after that time.

MR. KIRSCHBAUM: Do you not think that the seal gives the public an illusion? Suppose a person walks into the store and asks the question, "How do I know your scale is right?" The fellow will say, "Well, here is the seal of approval." However, the seal may be two years old or older.

MR. COTTON: I want to discuss the issue as to whether or not it is poor public relations to have on a scale a seal that shows that it has not been inspected for some time. If you do not have sufficient personnel to make inspections every year, maybe such a notice to the public is good public relations. Let me explain that. One of the things we have used in our State to get more personnel and to get more equipment is the correspondence that has come to our office from business and industry stating that "My scale has not been inspected since such-and-such a date and I want you to get out here and do it." This is persuasive material to use before the Legislature to show why an important activity such as this requires additional personnel.

MR. HARRIS: In review of your program the last year or so, have you formed any opinion as to what is the most important thing facing weights and measures jurisdictions and how the National Conference can be improved to help accomplish some of these objectives?

MR. KIRSCHBAUM: I think our basic problem is to equip and staff our program so that we can do a better job. The problem of uniformity is also quite basic. There could also be considerable improvement in the exchange of information between jurisdictions within a State.

As to the National Conference, I think the meat of the Conference is in the committees. Perhaps it would be advisable to increase the dues of the Conference so as to pay part of the expenses of the committee members to meet more frequently and to work out problems that arise.

MR. SANDERS: You placed great emphasis on package checkweighing and suggested, I believe, something along the nature of a co-operative program, working with manufacturers, the people who put up packages, the wholesalers, the distributors, etc., looking toward what might be termed a statistical quantity control system. Could you amplify that? Have you carried it any further toward putting it into effect?

You also emphasized the need for building up good public relations and promoting better budgets. Could it be that, through a study, a simple system could be developed that could be used by any State or local department to prove the value of weights and measures not only to the public but to the Legislature and City Councils?

MR. KIRSCHBAUM: In answer to your first question, we did, in several instances, run surveys in Wisconsin. The first survey in which we used statistical analysis was on fertilizer. We weighed about 1,200 packages at 8 different manufacturing plants. We analyzed the data and graphed the industry curve and plant curve. It was very effective. I think the idea is very similar to what has been presented to the Conference on several occasions by Mr. E. P. Lee of General Foods Corporation. I have no answer to your second question.

MR. J. G. ROGERS: I would like to know what you mean by scientifically selected samples?

MR. KIRSCHBAUM: I had reference to the test procedures recommended by the National Bureau of Standards for package checkweighing. The Bureau recommends so-many packages out of so-many lots be selected for checkweighing.

REPORT OF THE WEIGHTS AND MEASURES ADVISORY COMMITTEE

By J. P. McBRIDE, *Chairman, Director of Standards, State of Massachusetts*

The Weights and Measures Advisory Committee to the National Bureau of Standards is now completing its third year and we are deeply appreciative of the opportunity to serve the National Conference and the National Bureau of Standards in this work so important to our people. The Committee met for a full day session at Washington on January 17, 1957.

Since our last report, the personnel of the Committee has been changed in that Mr. W. A. Scheurer, President of Exact Weight Scale Company, has been named to the Committee vice Burns H. Dreese, deceased.

This Committee, as you will recall, came into being by authorization of the Secretary of Commerce to serve for the purposes and in the manner set forth in the report to the Secretary of Commerce on October 15, 1953, by the Ad Hoc Committee for the evaluation of the present functions and operations of the National Bureau of Standards and at the request of Dr. Astin, Director of the National Bureau of Standards, to aid the Director in forming new programs and in the consideration of balance on programs in being, insofar as they relate to weights and measures.

The National Bureau of Standards has a wide scope of activity, as outlined in its Organic Law of 1901 and amendments of 1950, and in this period of advanced industrialization, it is sorely taxed to meet

its constantly increased duties. In the Organic Act of 1901, among its authorized functions we find the following:

The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government.

The construction of physical standards.

The testing, calibration, and certification of standards and standard measuring apparatus.

Cooperation with the States in securing uniformity in weights and measures laws and methods of inspection.

Thus we see that weights and measures was in the beginning and still is an essential part of National Bureau of Standards work.

The National Conference is an important part of the program of promoting uniformity among the States in weights and measures laws and methods of inspection, and this Conference is sponsored by the National Bureau of Standards, the first Conference being called by the Bureau in 1905. Incident to the subject of the National Conference, the Committee in its last report recommended to the Director that a study be made of the National Conference with particular reference to its organizational structure, its procedure, and its relation to the National Bureau of Standards, all to the end that the Conference be preserved, but that the relationship and functions of the two bodies be clearly defined. This Study Committee was promptly authorized by the Executive Committee of the National Conference, and its report is to be submitted to the Forty-Second Conference. It will be observed that this report represents considerable work and sound policy recommendations, and its adoption will undoubtedly be beneficial to all concerned.

Among the findings made by the Ad Hoc Committee was expectation of a continuing and growing demand for the kind of assistance that the Office of Weights and Measures of the National Bureau of Standards is uniquely qualified to furnish the State governments and that compliance with this demand will require increased appropriation. The Committee is in accord with this finding and each year has recorded itself in agreement with the National Bureau of Standards budgetary requests as mentioned in our previous reports. Some improvement in financing has been accomplished and we believe this has contributed to bringing the liquefied petroleum gas program to the point where a code has been developed and will be submitted for action at the Forty-Second Conference. This program has been under consideration for a considerable period of time.

We have 2 other programs in contemplation; namely, static weighing of axle loads and a code on the commercial measurement of liquid fertilizers, which we hope will soon move to completion. It is probable, however, that curtailment may occur in budget requests for the coming fiscal year. This is to be regretted as the weights and measures branch of the work does not appear to have been over-expended, and it is hoped that recognition will be given to the needs of this activity as it directly affects every person in the nation.

We have made certain other recommendations to the Director which we believe will aid weights and measures work. The National Bureau of Standards is in contemplation of relocation of all of its facilities in one area and your Committee is in contact with the Program

Policy Council of the National Bureau of Standards concerning phases pertinent to weights and measures in this new plan. Your Committee feels that we have made some progress in the fulfillment of recommendations made to the Director of the National Bureau of Standards, and we wish to thank Dr. Astin, Director of the National Bureau of Standards, Dr. McPherson, Associate Director for Testing, Mr. Bussey, Chief of the Office of Weights and Measures, Mr. Jensen, Assistant Chief of the Office of Weights and Measures, and the other members of the National Bureau of Standards Staff with whom we have consulted, for their receptive attitude and cooperation in furnishing the Committee with data and information necessary in its deliberations.

REPORT FROM NATIONAL SCALE MEN'S ASSOCIATION

By J. M. SPINKS, *President, NSMA, and President, Spinks Scale Company, Atlanta, Georgia*

On behalf of the National Scale Men's Association, I wish to thank the National Conference on Weights and Measures for each year inviting its President to appear on the conference program, to report on the activities and future plans of the NSMA.

To recite some history, around the turn of the century most railway cars were about the size of the highway trucks now in use. Shortly thereafter, the railroads began building heavier steel cars. The small-capacity railway track scales then in use required almost constant repairs and overhauling, and to maintain these light scales in service, there were located large scale repair shops. At one time there were possibly 300 to 400 real scale mechanics who were blacksmiths as well as hand machinists. I can attest to the fact that it was very hard, heavy work to maintain those old, small scales for I was one of the scale mechanics in those days.

The railroads and industries were slow in buying heavier scales to accurately weigh the heavier cars.

These scale repairmen had common problems and formed the NSMA. For many years the NSMA Membership was largely scale men interested in railway, livestock, grain hopper, and large industrial scales.

Around 1913 after the National Bureau of Standards put into service the large Track Scale Testing Unit, and then, following closely the development of automatic dial scales and the retail computing scales, some State and local men in weights and measures work saw the need of an organization such as the NSMA, where men in all phases of weights and measures work could meet on equal terms and discuss common problems.

The history of NSMA through the years from 1914 to about 1950 could well be summed up as "A Crown of Glory," for the brave men who led the small national membership and maintained the high ideals, always worked to furnish better weighing equipment and more accurate weights to Americans.

Since about 1950, the NSMA has realized and accepted the responsibility in our growing industrial, electronic, and agricultural economy of an organization to be comprised of all men in weights and measures work to meet regularly, in all sections of the country, to

discuss common problems and arrive at decisions, so that all may do their particular work more effectively.

The NSMA 1957 National Convention was held in Minneapolis, Minnesota. Fifteen topics, including speakers and panel discussions, were presented on modern scales and weighing. There are now 16 local divisions with present membership over 700. Most of the local divisions have 4 meetings each year.

I hear criticism in many jurisdictions within our profession. Either the weights and measures official is criticizing the scale salesman or serviceman, or the scale salesman or serviceman is complaining about the weights and measures official. In many instances, maybe the trouble was with the scale user, who was trying to use old or inadequate equipment. Anyway, the most practical way to have all in our industry working in the best harmony is for all to meet on common ground through local meetings of NSMA. It is almost as simple as to meet and get acquainted and to learn that each is just another man more or less like ourselves, trying to make an honest living for himself and his family.

As President of NSMA, let me invite each of you to join your local Division of NSMA, get acquainted with all the men in our profession, solve our complaints, and then go out on your particular job with complimentary remarks about others in our profession in order that we may convince the public of the importance of scales and weights and measures.

AFTERNOON OF WEDNESDAY, JUNE 5, 1957

—NO BUSINESS SESSION—

NATIONAL BUREAU OF STANDARDS OPEN HOUSE

A tour of the National Bureau of Standards laboratories was conducted during the afternoon for many of the delegates and guests of the Conference.

FOURTH SESSION—MORNING OF THURSDAY, JUNE 6, 1957

(M. A. NELSON, VICE PRESIDENT, PRESIDING)

STANDING COMMITTEE APPOINTMENTS

The President made an announcement of the following appointments to the standing committees of the Conference:

Committee on Education: Mr. W. A. Kerlin, Alameda County, California, was appointed for a 5-year term to replace Mr. W. A. Baerwolf, whose term has expired.

Committee on Laws and Regulations: Since the membership of this committee has been larger than the standard number of 5, established by Conference action, only one of the vacancies created by the retirement of J. A. Boyle from State service, and expiration of the terms of G. H. Leithauser and M. A. Nelson, is being filled. Mr. Robert Williams, Nassau County, N. Y., was appointed for a 5-year term to fill the vacancy.

Committee on Specifications and Tolerances: C. L. Jackson, Wisconsin, was appointed for a 5-year term to replace R. E. Meek, whose term has expired.

A NATIONAL SURVEY OF STATE WEIGHTS AND MEASURES LEGISLATION, ADMINISTRATION, AND ENFORCEMENT

By L. J. GORDON, *Director, Weights and Measures Research Center, Denison University, Granville, Ohio*

I.

Twenty-three months ago I had my first interview with a State director of weights and measures. Since then, the responsible official of every State, with the exception of Delaware, has been interviewed. In the case of Delaware, there has been an exchange of correspondence and a telephone conversation.

During each interview, which ranged in length from 2 hours to 4, the official responsible for administering weights and measures legislation in each State answered 66 questions pertaining to the law of his State, its administration and enforcement.

Preliminary reports have been given at the annual meeting of the Northwest Weights and Measures Association in St. Paul, November 1, 1956; at the eleventh annual conference of the Southern Weights and Measures Association, November 15, 1956; to the Great Lakes Division of the National Scalemen's Association in Columbus, February 8, 1957; and to the Indiana Association of Inspectors of Weights and Measures, April 22, 1957. Summaries of these reports have been published in the December 1956 issue of the *Scale Journal* and in the February 1957 issue of the *Southern Weights and Measures News Letter*. All of the oral and written reports were based upon research

completed up to the time of the report and are, therefore, incomplete. The last interview was held January 30 this year, so the report presented to you today covers all jurisdictions in the territorial United States.

In April, the Council on Consumer Information published a pamphlet under the title "Watch Your Weights and Measures." Copies of this may be obtained from the Executive Secretary, Colorado State College, Greeley, Colo. That pamphlet was written primarily for the information of the consumer-buyer. My report to you will deal with more technical aspects and in greater detail.

Most of this paper consists of a summary of statements made to me by weights and measures officials. To that extent, it is a reporting job. In the course of my work I have studied the law of every jurisdiction and have read a substantial quantity of material in annual reports and in the publications known to all of you.

You may think it bold for a layman to offer recommendations and suggestions to the experts in the field. I agree with you. But to the extent that I represent a consumer point of view, perhaps what I have to say may be of interest to you.

When I saw one of the State officials recently, a man for whom I have a very high regard, he asked how my research was progressing. Then he surprised me by asking, "When you make your report are you going to pull any punches?" My response then and now is that I did not spend all the time and money that has gone into this project for fun. As honestly and as courteously as possible, it is my intention to report what I have found and to offer suggestions which seem to me to hold possibilities for improving State laws and enforcement programs.

II.

1. Let us begin with the Model Law. Forty-three of my sixty-six questions were designed to compare the provisions of the law of each State with the 1951 revision of the Model State Law on Weights and Measures. Actually, there are 3 models. Which of these is most prevalent? Investigation discloses that 14 States have Form 1, 29 have Form 2, while New York and the District of Columbia have Form 3. Arkansas, Delaware, Mississippi, and New Mexico are not included in these figures nor in any of the others that follow, because they do not have effective laws. Either there is no general law, as in Mississippi, or if there is a law, it is defective and not enforced.

As you know, Form 1 provides for testing and inspection by State officers only, Form 2 provides for testing and inspection by State and local officers, under supervisory control of the State, while Form 3 provides for testing and inspection by local officers only, under supervisory control of the State. In a study of this kind one almost invariably encounters unforeseen difficulties. In this case, for example, the situation found in the District of Columbia is not strictly classifiable under any one of the three Forms, but more closely resembles Form 3. In one case, the director reported a Form 1 law, although the law clearly provides for local officers. What does one do in such a situation? First of all I corresponded with the officials concerned, but in the final analysis I took my reading of the law as the basis on which to determine an answer.

Which of the 3 forms of the Model is preferable? Without taking time to present all the arguments for and against each form, 3 defects

of Forms 2 and 3 seem obvious. First is the probability that, except in large cities and counties operating under civil service, inspectors are more likely to be appointed for political reasons than for their competency to work with specialized technical equipment. A second probability is a conflict of responsibility and power, with resulting loss of protection to sellers and buyers. For example, 1 State director reported that 2 State inspectors followed immediately after capital city inspectors in one test. More than half of the scales that the city men had approved and sealed were found to be inaccurate. A third difficulty is financial. Small cities and sparsely populated counties simply cannot afford the expensive heavy duty equipment necessary to test some devices. Neither do they pay salaries necessary to obtain the services of qualified men without exploiting them. My study was limited to State legislation and enforcement, so I am unable to give a firsthand report on local experience. However, the following information from the May 20, 1954, issue of the *Newsletter* of the New York State Weights and Measures Association is relevant. About $\frac{1}{2}$ of retail store scales and gasoline station pumps in Auburn, New York, had been registering inaccurately, in some cases for years. The inaccuracies were 2 to 1 against the consumer, and the losses to buyers and sellers were estimated to amount to as much as \$200,000 a year. Neglect by city officials went back as far as 25 years. Among the startling discoveries were gasoline pumps registering $\frac{1}{4}$ of a gallon short on a 5 gallon delivery and scales registering 8 ounces over on each weighing.

I can report that at least 3 officials operating under a Form 2 law expressed the view that they could do a much better job if they had a Form 1 law.

2. The title of the enforcement officer in the Model Law is Superintendent. (Sec. 4.) What titles does one find in the State laws? In 17 States the responsible official is called director; in 9 States he is a chief; in 7 a supervisor; 4 States give him the title of sealer; 3 are called commissioners, 3 State inspectors; leaving only 3 using the title of superintendent.

3. More important than the title is the location of weights and measures work in State government. The Model Law does not designate any specific department of the State government, nor does it suggest that there should be a separate department of weights and measures. It was found that weights and measures work is housed in the Department of Agriculture, or some combination involving Agriculture, in 32 States. Two States have put weights and measures work in the Department of Labor, while the remainder are scattered among such departments as Internal Affairs, Health, and Public Service. To those close to weights and measures work, a separate autonomous department seems justified. Arizona alone has such a department. If we are to be realistic, we must recognize that Agriculture is the most common, and that, for the foreseeable future, weights and measures work is going to continue to be a subdivision of an Agriculture Department.

4. The Model Law does not specify civil service for the superintendent, but does for the deputy and for the inspectors (Sec. 4). Investigation reveals that the superintendents, or their counterpart, in 17 States and the District of Columbia have civil service. Some men have been in their positions many years, even though they do

not have tenure, but in at least 7 States, directors are political appointees with little or no previous experience in weights and measures work. In some such situations a permanent deputy officer provides continuity of administration, but top policy may change. In 1 of these States it has changed drastically and unfortunately.

5. The Model Law gives the superintendent authority to issue regulations which have the force and effect of law (Sec. 7). All but 4 State officers have this power in some form.

6. In the same section, the Model Law authorizes the Superintendent to designate specifications and tolerances. It was found that the laws of 21 States permit tolerances, but several directors objected to them vigorously. In fact, one incidental discovery of this study was that directors are divided on the issue of tolerances, many of them objecting that in practice the tolerance tends to become the maximum. I suggest that in the future it seems likely that consumers will become less tolerant of tolerances. Scalemen are now producing scales with an accuracy undreamed of when many State laws were enacted. Tolerances that might have been justified in the years before 1930 are no longer necessary. For many weighings and measurements, tolerances can and should be eliminated or reduced.

7. The Model Law requires inspection of commercial devices once annually ". . . and as much oftener as may be necessary . . ." A similar provision is found in the laws of 32 States. In 1 State, the director is required to test "as often as is practical." How well is such a provision enforced? Six directors reported two inspections a year, but 11 said they get around less than once annually, simply because they do not have enough money to buy the necessary equipment and hire the men needed. In Montana, for example, I was shown dust-covered equipment, unused because 2 vacancies on the staff could not be filled at a wage of \$250 a month. At this point, a comment by the director of the Bureau of Weights and Measures for New York City is relevant. After noting the technical changes that have occurred, Mr. Fred J. Loughran was reported in the *Newsletter* of the New York State Weights and Measures Association for December 20, 1956, as saying: "The time-consuming ceremony of testing scales twice a year could be better devoted to the detection of shortweighing and overcharging practices." At this point I wish only to refer to a suggestion on which I shall elaborate later in the paper, that a modified use of a fee system might be justified to finance more than one inspection a year.

8. As a generalization, it can be reported that the police powers of State officers and inspectors are adequate and reasonably similar to those recommended in the Model Law.

9. Section 20 of the Model Law makes it unlawful to package commodities so as to mislead buyers, and gives the superintendent power to prescribe standards of fill. A similar provision is found in the laws of 14 States. Four others have included it by regulation and in 6 additional States such a provision is found in another law. However, only 10 State laws give the superintendent power to prescribe standards of fill. Four more give him this power by regulation, in 2 States it is vested in the Commissioner or Board of Agriculture, and in 1 State it is granted in another law.

10. How many State laws require the sale of all commodities by net weight when sold on the basis of weight? This provision is found in the laws of 28 States and in 2 more by regulation. In 4 States such a provision applies to food products only, while in 3 States a similar provision is included in another law.

11. Section 23 of the Model Law requires "that whenever any commodity or service is sold, or is offered, exposed, or advertised for sale by weight, measure, or count, the price shall not be misrepresented, nor shall the price be represented in any manner calculated or tending to mislead or deceive an actual or prospective purchaser." Only 5 State laws contain the first part of this important provision, although 2 others have included it by regulation and a similar provision is found in other laws in 6 States. The weights and measures laws of 11 States make it illegal to mislead buyers, while related laws in 5 States include essentially the same provision.

12. In Section 24 of the Model Law, the sale of fish and poultry by weight is prescribed. Only 8 States have this provision in their weights and measures laws without qualification. One State has it for meat and fish only, 5 have it by regulation, and 6 have it in their food laws. Responses to questions 9, 10, 11, 12, and some that follow, disclose a basic and major problem in conducting such a survey. Weights and measures legislation is found in food laws, dairy laws, and special laws dealing with such commodities as flour, bread, butter, oleo, and milk. In Michigan, for example, the enforcement officer administers the food law and 100 additional laws and regulations. Technically, only 5 of my questions were specifically covered by the Michigan law on weights and measures. But, in fact and in practice, the answers to 12 other questions were affirmative. In other words, authority which the Model Law on weights and measures vests in the superintendent is found in related Michigan laws. This prompts me to urge that where the Model Law is being considered, as it is currently in Missouri, it be followed closely as was done by the legislators of Colorado in 1953. At the same time, the coverage of the Model should be broadened, as will be indicated later in this paper.

13. In Section 25, the Model Law prescribes the sale of bread by weight in loaves weighing $\frac{1}{2}$ pound, 1 pound, $1\frac{1}{2}$ pounds, or multiples of 1 pound. Only 5 States have this provision without qualification. Five other States have a variation of this section, and six more have it in other laws. The importance of such a provision was illustrated in one State, where the director reported that some bakers were selling 15-ounce loaves at 16-ounce prices. The same section dealing with bread permits "reasonable variations or tolerances." Nineteen States follow the Model Law without qualification, giving the superintendent power to promulgate tolerances, while three other States include such a provision in the law itself. This raises again the question as to whether tolerances should be permitted. All I can report is that there is not unanimity of opinion on this issue among the men interviewed.

14. In Section 26, the Model Law prescribes the sale of butter, oleo margarine, and margarine in packages whose weight is specified. Only 7 States follow the Model Law without qualification, but a similar provision is found in another law in 7 other States. In one State butter alone is specified, and in another the section has been promulgated by regulation.

15. The sale of milk in packages of specified content is covered in Section 27 of the Model Law. Fourteen States follow the pattern without qualification, 5 by regulation, 1 in another law, and 9 with variations such as $\frac{1}{3}$ quart, "if in glass jars," and so forth.

16. In the Model Law, flour, corn meal, and hominy grits must be in specified weights when in package form (Sec. 28). Only 6 States follow this recommendation without qualification, but 20 others include it with such qualifications as permitting 2 pounds or not permitting 3-pound packages. Two States have such a provision in another law.

17. Section 29 of the Model Law requires the sale of coal, coke, and charcoal by weight. Thirty-two States follow this recommendation without qualification and one by regulation. The Model Law also requires duplicate delivery tickets, a provision found in the laws of 28 States and of 1 more by regulation. Many of the States that do not have this part of the Model Law in their laws are in the South where gas is commonly used. But in other areas, natural gas, liquefied-petroleum gas, and fuel oil are competing with coal as a source of heat. Only 6 States check deliveries of fuel oil and only 10 check LP gas deliveries. The director of one State told me that one company was found short-measuring the State on purchases of fuel oil for the capitol building as much as 15 gallons per 100. In another jurisdiction, out of 42 meters tested, 30 were delivering short measure ranging from $\frac{1}{3}$ gallon to $2\frac{1}{2}$ gallons on each 100-gallon delivery.

18. The net content of textiles sold in spools, bolts, rolls, balls, coils, and skeins is required on the label, according to the Model Law (Sec. 30). Only 9 States follow this section without qualification and 1 by regulation. One State has a similar provision in another law, while four require net content labels for thread only.

19. As a consumer, my wife objects to purchasing berries, small fruit, and vegetables by dry measure. She prefers to buy them by weight. But even the Model Law is disappointing to her in this respect, as are the laws of 42 States. Only 2 State laws require the sale of these products by weight, while 1 requires it by regulation.

20. The penalty provisions of the Model Law need not be summarized for this audience. From more than one official I have heard arguments supporting small fines and emphasizing the punitive value of publicity. But I remain unconvinced. State officials were asked this question: "What percent of retail sellers in your State do you estimate are dishonest?" Responses ranged from $\frac{1}{10}$ percent up to 15 percent. Three men estimated less than 1 percent, 10 thought 2 percent was fairly accurate, 8 went as high as 5 percent, and 7 went to 10 percent. Any way one interprets these figures, one must conclude that there is a substantial volume of short weighing and short measuring. So it is pertinent to consider the penalties which may be invoked. Are they adequate? The directors of 12 States do not think so. Fines of 10 or 20 dollars are no deterrent to the wilful or chronic violator. He can recover such a sum very quickly. Many officials are impressed with the deterring effects of adverse publicity and insist that they prefer prevention to prosecution. Yet some officials also complained of their inability to get newspaper, radio, or television coverage. Moreover, their own figures suggest that they neither prevent nor prosecute effectively. Out of 44 responses, the record shows not 1 prosecution in 22 States in the last report year.

At the other extreme, there were 5 States in which the number of prosecutions exceeded 100.

Florida and New York have unique injunctive clauses in their laws that give them real teeth. Here is the provision in the Florida law:

In addition to the remedies provided in this law, and notwithstanding the existence of any adequate remedy at law, the commissioner is hereby authorized to apply by a bill in equity to a circuit court or circuit judge and such circuit court or circuit judge shall have jurisdiction upon hearing and for cause shown to grant a temporary or permanent injunction, or both, restraining any person from violating or continuing to violate any of the provisions of this law or for failing or refusing to comply with the requirements of this law or any rule or regulation duly promulgated as in this law authorized, such injunction to be issued without bond.

The injunction is a powerful legal weapon, far more effective against the chronic offender than a fine of even several hundred dollars. One of my strong recommendations is that other States strengthen their enforcement of weights and measures laws by adopting and using a similar injunctive provision. In addition, I wonder whether it might not be possible to beat the silent treatment of newspapers, radio, and television by amending your State law to require that a notice of conviction be posted in a conspicuous place such as the front window or the check-out counter.

In concluding this portion of the paper, the evidence indicates that most States need better laws. Using the Model Law as a standard and the answers to 30 questions as a basis for scoring, only 5 States get a passing grade of 70 percent.

The Model Law itself needs strengthening. Developments in weighing and measuring devices and in merchandising practices take place so rapidly that it is difficult for weights and measures officials to keep abreast. As a consequence, some provisions of the Model Law may become less important or even obsolete, while new methods, devices, or products may not be included. Here are a few examples. The use of coal and wood as fuel is declining, while fuel oil, gas, liquefied petroleum gas, and electricity are being used more. Yet, there is no specific provision in the Model Law governing deliveries of any of these commodities. Gas, electricity, and water deliveries are presumed to be under the supervision of State public utilities commissions, but it would seem logical and preferable to place them under the weights and measures department.

The rapid increase in number of self-service type stores places even greater emphasis on prepackaged commodities and check-out practices. Although the Model Law makes it illegal to misrepresent the price of a commodity or service, there is no similar provision covering intentional or unintentional overcharging, charging for more items than the buyer has in his cart, or giving less than correct change.

The Model Law might well include a requirement that all food stores provide at least one test scale for buyers and place it where they can conveniently check the weights of their purchases.

Two more amendments that would greatly strengthen enforcement procedures are suggested. One is that the Model Law include a provision requiring the approval of all new equipment by the National Bureau of Standards before it can be sold in any State having that provision in its law. The National Bureau has the equipment and personnel to run the necessary tests. Such a change would free manufacturers from the necessity of securing the approval of several States, yet would give the States better protection than they have now.

To meet the problem of shortages on prepackaged items, would it not be feasible to include in the Model a provision requiring that the contents of packages be checked in the processing plant? Instead of waiting until thousands of packages are scattered throughout many States, their contents could be checked by the sampling method and errors corrected before packages reach the shelves of retail stores. Not only would this represent a great economy in time and effort, but it also should yield greater assurance of accuracy.

III.

Now let us turn to some findings and recommendations concerning the administration and enforcement of State laws. The number of years the director has held his position and the number of years experience he has had in weights and measures work give some indication of the effectiveness of an administrative program. The range in years of service of directors is from 1 to 38, and for weights and measures service from 1 to 42. At the time of the survey, the people of 5 States had had the same director more than 20 years. Directors for 4 States had served 15 years or more. There were 9 men whose experience ranged from 10 to 15 years, and 27 with less than 10 years. Seventeen directors have moved up to their present position after having served as inspectors long enough to know the job. The longest apprenticeship was 25 years, followed by 8 years as the top man.

The range in director's salaries is amazing. From a low of \$4,284, the figure rises to a high of \$11,533. In 12 States, salaries are \$5,000 or less, in 16 States they range from \$5,000 to \$7,000, in 11 States from \$7,000 to \$10,000. In 4 jurisdictions, salaries are \$10,000 or more. One may say—in fact one must say—that in most States, directors' salaries are too low. Salaries as low as some of those reported are a poor form of economy. No man worthy of the responsibilities of a State director of weights and measures should be paid less than \$7,200, with a range up to \$10,000.

The salary figures for inspectors are no less startling than those for directors. The range in minimum is from \$2,500 to \$5,011, with top salaries ranging from \$3,120 to \$8,940. In 14 States, inspectors' salaries start at \$3,000 a year or less. In 23 States, the starting pay is from \$3,000 to \$4,000. In 14 States, an inspector cannot look forward to as much as \$4,000 as the maximum salary, while in another 20 States he will never exceed \$5,000. This means that the maximum salary an inspector can earn in 34 States, regardless of number of years of service, is \$5,000. No State should ask any man to serve as an inspector at a starting salary of \$2,500 or for a maximum of \$3,000. I suggest that the minimum starting salary for an inspector should be \$4,000 annually with annual increases and a high enough maximum to hold good men and enable them to live comfortably without having to supplement their income by taking a second job, or by other more questionable means.

As indicated before, this study did not include counties or cities. There is some evidence, however, that the salary situation may be even worse at those levels. For example, Mr. E. J. Roberts, City Sealer for New Rochelle, surveyed salaries in 52 cities in the State of New York. Sealers in 13 towns were paid less than \$1,000 a year, while in 13 additional towns the range was from \$1,000 to \$2,000.

Ten paid from \$2,000 to \$4,000, and 11 from \$4,000 to \$5,000. Just one illustration. The Sealer for Gloversville, New York, is paid \$1,000, with no expense allowance for the operation of his automobile.

You men in weights and measures work must give serious consideration to the problems resulting from creeping inflation. From February 1956 to February 1957 the Consumer Price Index rose from 114.6 to 118.7. Have you thought of the implications of a yearly rise of 4 percent in prices? Salaries of public officials lag far behind in a period of rising prices. Perhaps your salary schedules in the future should include escalator clauses that provide for automatic pay increases proportional to a percentage rise in the price level.

It takes money to enforce a law. Although a director may have a good law, he may be handicapped by lack of funds, or by their source. In spite of all that has been said and written in criticism of the fee system, 15 States use it, and 6 other States derive revenue from license fees on gasoline, gasoline pumps, feeds, fertilizers, and warehouses.

A variation of the fee system as used in Minnesota deserves attention and possible wider use. Under such a plan, all devices are tested once a year, but if an owner wishes to have more frequent tests he pays a fee. One large user, for example, has his scales tested every three months, paying extra for the service. Not only is that company more sure of the accuracy of the scales, but it advertises the practice as a method of building good will by assuring sellers that the weights determined on the buyers' scales are accurate.

Accurate budget figures are difficult to secure. Some States do not separate weights and measures budgets from the total appropriation for the Department of Agriculture, for example. Some figures may be misleading, because they include money for administration and enforcement of several related laws. Figures for States having Form 2 laws are not strictly comparable with those for Form 1 States, since the former are supplemented by the budgets of counties and cities. In New York State, for example, in 1954, counties spent \$353,426, and cities \$233,561, while the State spent only \$70,000. So to render comparisons more valid, budget figures have been reduced to a per-capita basis and classified according to type of law being enforced.

In 14 Form 1 States per-capita expenditures for weights and measures enforcement range from 1.9 cents in Georgia to 27.5 cents in Nevada. Florida, Vermont, and Wyoming spent 9.6, 9.4, and 9.6 cents, respectively. All the others spent from 4 to 5 cents.

In 19 Form 2 States the figures ranged from $\frac{1}{10}$ cent in Tennessee to 9.4 cents in North Carolina. In 9 States the figures were less than 3 cents, and in another group of 9 States they ranged from 3 to 5 cents.

Out of 43 responses, only 7 directors think their budgets are adequate. Estimates of the additional amounts of money needed to do an adequate job of enforcement call for increases ranging from 4 to 200 percent.

It has been suggested that a director should have an inspector for every 50,000 people in his jurisdiction. In Form 1 States, Nevada is the only one to meet this standard, having one inspector for every 43,000 people. Florida, Montana, and North Dakota have one for every 80,000. In this group of States, the lowest ratio is found in South Dakota, where there is only one inspector for every 222,000 people.

IV.

Only 6 out of 45 States surveyed, counting the District of Columbia as a State, have a regular public information program. As a layman, I find amazing ignorance among my fellow laymen concerning weights and measures. First of all, many of them do not even know simple weights and measures in daily use. Recently I ran an experiment in which 371 people were asked these 10 questions: How many ounces in 1 pound avoirdupois? How many quarts in 1 peck dry measure? How many pecks in 1 bushel dry measure? How many ounces in 1 quart liquid measure? How many sheets in a quire? How many quires in a ream? How many cubic inches in a standard bushel? How many cubic inches in a standard gallon? How many pounds in a ton? How many ounces in 1 pint liquid measure? Counting 60 as a passing grade, only 19 out of 68 of my colleagues on the University faculty passed. In percentage terms 80 percent failed. Among the teachers in our high school 70 percent failed, among college sophomores in an economics course 91 percent failed, and among 169 high school students 90 percent failed. Combining the four groups, 321 out of 371 failed, for a total of 86 percent. Obviously, something is wrong somewhere. I suspect the trouble may be found in the method of teaching weights and measures to young people. The members of this Conference could perform a tremendously important public service by testing my results more widely and undertaking to help the public schools in their jurisdictions improve the method of teaching weights and measures.

One of my faculty colleagues who could answer only four questions, wrote in the margin, "this is unimportant and useless information." Granted that he was trying to save face, that is a surprising comment. A high school teacher admitted that she never considered the quantity involved in a purchase. When I asked her how she could tell whether she was getting a correct amount in relation to the price, her answer was that she simply trusted her butcher, baker, and grocer.

Very few of my fellow laymen know anything about the weights and measures law of their State, or about the work that you men are doing. This is really not entirely their fault, because so few officials make the effort to tell their constituents what they are doing. This may be due partly to lack of funds, but I suspect that some of it is a result of lethargy and lack of imagination. Whatever the reasons may be, it seems to me that 39 State departments of weights and measures are missing an opportunity to tell the citizens of their States about their work. Early in April, in St. Louis, I showed a Virginia film entitled "Getting Your Money's Worth" to a select audience composed mostly of teachers attending the Third Annual Conference of the Council on Consumer Information. Although not one of them could answer all ten questions in my quiz, they were all interested in the film and rated it highly. In 15 minutes they learned a lot of things that they had not previously known about the importance of weights and measures.

In preparation for an exhibit to be used at the St. Louis conference showing weights and measures men at work, I wrote to the directors of several States asking for photographs that would be of interest to consumers. Letters went to perhaps a dozen directors. In return I received usable materials from 7.

Informed buyers could be educated to serve as unofficial inspectors. One way to arouse their interest might be to issue a special badge or inspector's card to any woman or man who completed a short course in weights and measures legislation and enforcement practices in his jurisdiction. As these people learn more about the field work needed to assure them accurate weights and measures, they could be expected to support larger budgets. These in turn would make possible better enforcement. In the long run, all sellers and all buyers would benefit, except the 2 or 5 or 10 percent of sellers who should be curbed.

V.

1. Here are some miscellaneous findings. The trend toward compulsory retirement at an arbitrary age is found in 30 States. The most common age is 70 rather than 65, that being the retirement age in 23 of the 30 States.

2. Thirty-seven States make it possible for their weights and measures officials to attend this National Conference in Washington each year. In addition, two more State governments pay expenses every other year.

3. This brings up an incidental finding concerning the place of meeting. In the western areas there is some sentiment for a more central place, such as Denver, for example. Perhaps the National Conference could borrow a practice from the American Economic Association of which I am a member. One year we meet in the East and the next year in the Middle West, thereby making it possible for more members to attend. In that way it would be possible to retain the advantages of meeting in Washington and gain some of the advantages of meeting elsewhere.

4. Another incidental finding was the sentiment in favor of a western association. As one who has attended one meeting of the Northwest Association and two meetings of the Southern Association, it would seem to me that the States in the western area should be encouraged to organize and participate in an association. I have been most favorably impressed with the quality of the meetings of the existing regional associations and have seen many evidences of their constructive work.

5. In response to the question "What do you think of the proposal for a Federal grant-in-aid to States which adopt the Model Law and establish minimum enforcement programs?" fifteen officials expressed themselves as favoring it without qualification. Two more said they were in favor of it in principle. Twenty-two officials are opposed, three had no opinion, and one neither favors nor opposes. There is no pattern to the answers. Those who favor range from New York to Utah, and from Pennsylvania to Colorado. The director for one small State said that such a plan would offer marvelous help to small States like his in the purchase of heavy duty equipment. Those opposed to the idea range from Louisiana to Maine and from New Jersey to Washington State.

6. In response to the question "Do you have any special problem in your State?" there were 23 affirmative and 20 negative replies. Among those answering affirmatively, 8 mentioned the farm milk tank problem, 6 the problem of checking liquefied petroleum gas, 3 the land area of their State, and 5 admitted that they are plagued with politics. Other problems mentioned include tobacco shrinkage,

liquid fertilizer, the home-freezer food plan, inability adequately to test railroad scales, the animosity of owners of weighing and measuring devices to the fee system, the exemption of soap from regulation, and the use of unapproved scales.

VI.

Here are two problems that do not fit into the arrangement plan of this paper elsewhere. After having traveled the length and breadth of this vast nation, one may wonder whether a Model Law can be drafted that will be generally applicable. The section pertaining to the sale of coal is unimportant in many areas. In one region interest is high in cotton, in another in tobacco, in another cattle, and in another wheat. Nevertheless, there are basic provisions that can be generalized and are important in every region.

Two States reported a sort of no-man's-land in checking pre-packaged items. In one State, the weights and measures official said that he did not have enough money in his budget to check packaged candy. He quoted the Food and Drug Administration as saying that they did not have enough money either. As a consequence, packages of candy, to mention only one item, were unchecked. During a recent Christmas season, a State official ran a spot check and found 80 percent of the packaged candy shortweight. In another State whole car-loads of flour were reported to have proven shortweight. The official for that State raised the question why the Food and Drug Administration did not give more attention to quantity. Knowing that Federal meat inspection is carried on at the packaging plant, one wonders why a great deal more inspection could not be handled more effectively at the source.

Having attended three regional conferences and one National Conference, I am puzzled by the absence of Food and Drug Administration representatives. To an outside observer it would appear that food and drug, and weights and measures officials have much in common. May I suggest that in planning the program of this Conference next year, consideration be given to the possibility of arranging a joint morning or afternoon program with food and drug officials. In some States, the work of weights and measures officials and food and drug inspectors is coordinated under one administration. And one reason that some State directors do not get to the National Conference every year is that one year they attend this meeting and the next year attend the Food and Drug Administration meeting.

This concludes my report and recommendations. But it does not conclude my interest in weights and measures. In the years ahead I should appreciate it if you would tell me about changes in your laws and if you would send your publications to me and your annual reports. I think of my project as a continuing one in adult consumer education. I hope that I may be able to publish a series of articles that will be helpful not only to consumer-buyers, but to legislators and weights and measures officials.

REPORT OF THE COMMITTEE ON NOMINATIONS, PRESENTED BY V. D. CAMPBELL, CHAIRMAN, AND ELECTION OF OFFICERS

The Nominating Committee submits the following report, including nominations for office in the National Conference to serve during the

ensuing year, or until such time as their successors are elected. Consideration was given by the Committee to certain fundamental criteria upon which nominations should be based. Among these were established custom, geographical distribution, attendance records, previous recognition, and participation in the work and affairs of the Conference. Because of the adoption of a new Conference Organization and Procedure, and the retirement of Mr. George F. Austin, Jr., who has served long and faithfully as Treasurer of the Conference, the Committee has striven to fulfill its responsibility by nominating to the several key positions, men of recognized ability, integrity, and interest in the Conference. As a result of lengthy deliberations, the committee selected the following 17 nominees representing 16 different States:

For Chairman: J. P. McBRIE, of Massachusetts.

For Vice Chairmen: C. D. BAUCOM, of North Carolina; S. H. CHRISTIE, JR., of New Jersey; H. J. McDADE, of San Diego County, California; R. W. SEARLES, of Medina County, Ohio.

For Treasurer: C. C. MORGAN, of Gary, Indiana.

For Chaplain: J. H. MEEK, of Virginia.

For members of the Executive Committee: T. C. BECK, of Oklahoma; ERLING HANSEN, of Minnesota; T. C. HARRIS, JR., of Virginia; J. J. LEONARD, of New York; RALPH MAGOFFIN, of South Carolina; V. D. ROGERS, of Memphis, Tennessee; W. M. SAXTON, of Lansing, Michigan; CLYDE SPRY, of Iowa; N. P. TILLEMAN, of Green Bay, Wisconsin; E. C. WESTWOOD, of Salt Lake City, Utah.

(Signed)

V. D. CAMPBELL, *Chairman*,

J. A. BERNARD

F. M. GREENE

J. FRED TRUE

G. L. JOHNSON

C. C. MORGAN

L. E. WITT

Committee on Nominations.

(The report of the Committee on Nominations was adopted and the officers were elected unanimously.)

REPORT ON LP GAS METER TESTING

1. PROGRESS AND EXPERIMENTAL TEST SETUP

By W. S. BUSSEY, *Chief, Office of Weights and Measures, National Bureau of Standards*

As many of you know, the National Conference has been considering the matter of measuring liquefied petroleum gas with fluid meters for many years, the subject having been presented first in a series of papers at the 30th National Conference in 1940, and subsequently at several other Conferences. Beginning in 1952, the Committee on Specifications and Tolerances decided that thinking on the subject had crystallized to the point where the preparation of a code of specifications, tolerances, and regulations for liquefied petroleum gas liquid-measuring devices should be undertaken.

Following a preliminary meeting in Boston, Massachusetts, the American Petroleum Institute offered its full cooperation and assistance, and shortly thereafter the Liquefied Petroleum Gas Association also offered its assistance. Mr. Adam Rumoshosky of the American Petroleum Institute was instrumental in setting up, in October 1954, the Cooperative Committee on Proving LPG Liquid Meter-

ing Systems, which was thereafter referred to as "The Cooperative Committee," to study the numerous problems prevailing and to offer a means of coordinating the efforts of the several organized groups participating in the program.

In line with the desires of the Cooperative Committee and through the facilities of the Liquefied Petroleum Gas Association and its member companies, various types of LP Gas provers were constructed, and a large number of experimental tests were made. A full report of that activity was furnished to the Committee on Specifications and Tolerances, and a Tentative Code for Liquefied Petroleum Gas Liquid-Measuring Devices was developed and presented to the 41st National Conference for action last year.

The Tentative Code was adopted by the Conference, but study in this area has continued without interruption. Industry, weights and measures officials, and the National Bureau of Standards have continued to make investigations, experiments, and tests. Much has been learned during the past 12 months. It is recognized, however, that additional information and data are essential.

Probably the most difficult problem with which we are still confronted is the matter of delivering the liquefied petroleum gas into receiving vessels without the use of vapor-return, or pressure-equalizing lines. The desired goal is to be able to deliver to a container an additional quantity of product without returning any of the original quantity to the supply vessel. I doubt that, at this time, anyone is certain that he has all of the answers to the many ramifications of the problem. Much work has been done and many things have been learned. Various oil companies, meter manufacturers, liquefied petroleum gas distributors, and State and local officials, particularly in the States of California, Florida, Kansas and North Carolina, have been doing experimental work in this area. I am confident that this effort will continue until the difficulties are solved to the satisfaction of industry, weights and measures officials, and the consumer.

It is recognized in the Final Report of the Committee on Specifications and Tolerances that more data, both practical and technical, are needed. The committee has offered a temporary solution to the problem in order that the Tentative Code might be offered for final adoption at this time, without imposing unnecessary hardships or restrictions upon anyone.

As indicated previously, much work has been done in the development of liquefied petroleum gas provers. Many types of provers have been built and experimented with. Satisfactory results have been obtained in numerous different ways. The National Bureau of Standards, basing its decision upon the majority opinion of the engineers and scientists working in this field and upon its own desire to produce a reasonably simple and equally practical piece of equipment, has had constructed an experimental prover of the volumetric type. This prover is actually a composite of all other volumetric provers built by industry and weights and measures officials. Many of you have seen this prover. Mr. Jensen will tell you more about it later.

Getting back to the problem of delivering product into the consumer's receiving vessel and at the same time making certain that none of the product which the consumer already has is lost to him, we have set up at the National Bureau of Standards, an experimental project (see figure 1). Some of you have seen it. This project com-

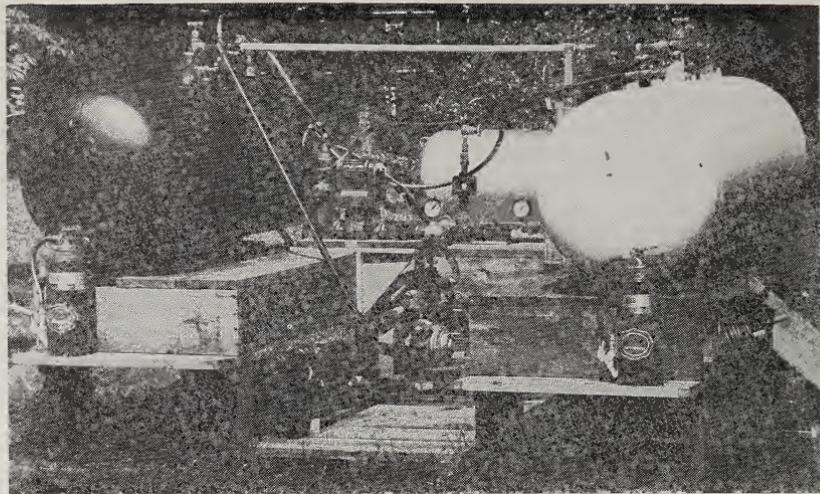


Figure 1. *Special NBS experimental LPG installation.*

prises four liquefied petroleum gas tanks, the necessary pumps, meter, vapor separator, and various fittings and accessories.

With the equipment we now have, we can transfer product from one tank to another, using any of the various methods that have been suggested as having possibilities. We can accomplish what is referred to as "top-fill," "vapor-fill," and "spray-fill." We can also "bottom-fill." We have means for using the "ejector" (sometimes called "injector" or "eductor"). This is the filling method that Mr. C. D. Baucom of North Carolina has been experimenting with for several months. We can also control rates of delivery, temperatures, and pressures.

We have the tanks arranged so as to get the full benefit of the sun's rays through use of specially selected paints. We also have arrangements for steam-heating and cooling with dry ice, thereby making it possible to produce extreme differentials in pressures and temperatures. We believe that we are prepared to reproduce almost any commercial condition that we have heard of, or that anyone has suggested.

We had several people from the liquefied petroleum gas industry visit us on May 16, 1957. They made several very helpful suggestions, all of which have been incorporated or are being incorporated in our setup. If any of you have additional ideas or suggestions, we would be happy to receive them.

We especially wish to recognize and thank the many persons, firms, and committees that have cooperated with us so generously in this project. They are too numerous to mention individually, and I am sure that any list that I might make up would be incomplete. I do feel that I would be remiss, however, if I failed to mention at least two companies that have contributed through the loan of exceptionally large amounts of equipment, engineering knowledge, and advice. These are the Suburban Propane Gas Corporation and the Downingtown Iron Works. Of course, we have depended upon the American Petroleum Institute and Liquefied Petroleum Gas Association to help coordinate our activity. Every suggestion that they or we have made

to any firm or individual concerning necessary pieces of equipment has met with very prompt response. Without this generous co-operation and assistance, we would not have the experimental setup that we do have today. Now that we do have it, we intend to continue its operation until this difficult problem is solved, if that is humanly possible.

We are informed that several oil companies and liquefied petroleum gas distributors are planning their own individual experiments in several sections of the country during the coming summer months. It is our hope that all efforts will be coordinated and that all of the information acquired will be pooled for the ultimate benefit of all concerned. I am confident that much additional knowledge will be

We are informed that several oil companies and liquefied petroleum of this troublesome problem will be forthcoming.

2. THE NBS LP GAS METER PROVER

By M. W. JENSEN, *Assistant Chief, Office of Weights and Measures, National Bureau of Standards*

(Mr. Jensen described the development of the 53-gallon prover for liquefied petroleum gas liquid-measuring devices (see figure 2) designed by staff members of the National Bureau of Standards with the advice and counsel of representatives of meter manufacturers and the LP Gas industry. He explained the testing procedure used by the Bureau and told of the tests made on the Bureau grounds and in Florida and Virginia to appraise the prover and procedure. Mr. Jensen informed the Conference that a prover of the NBS design was now available commercially, and that the recommended cali-

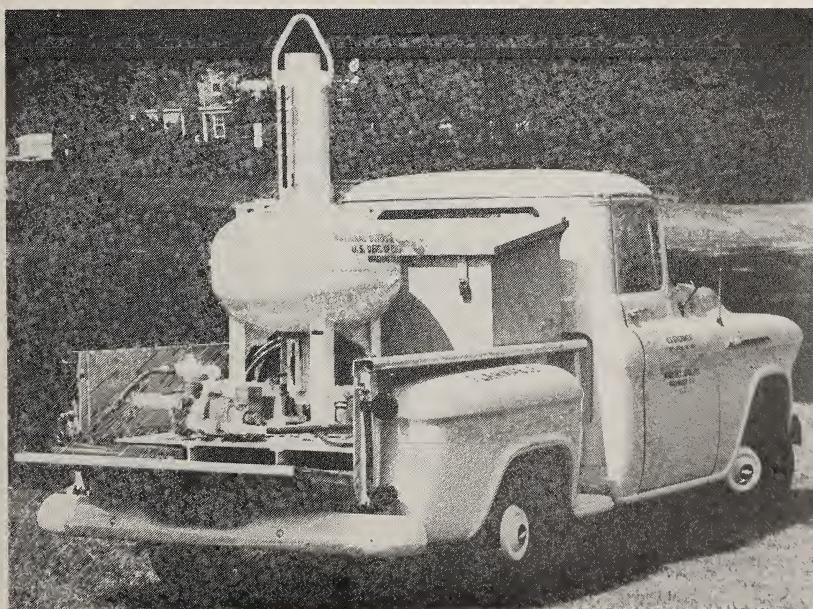


Figure 2. *NBS mobile LPG liquid-meter prover.*

brating procedure for the prover and testing procedure for commercial devices were being composed and soon would be distributed for comment.)

**REPORT OF THE COMMITTEE ON SPECIFICATIONS AND
TOLERANCES, PRESENTED BY R. E. MEEK,
CHAIRMAN, AND DISCUSSION THEREON**

Preliminary Committee work was carried on by continuous correspondence since the close of the 41st National Conference. The Committee met at the National Bureau of Standards in Washington, D. C., on January 17 and 18, 1957, for oral discussion on all pending items. Statements and reports were received from several weights and measures officials and others relating to particular items, and initial preparation was made for the Tentative Report.

Subsequent to the issuance and wide distribution on March 18, 1957, of its Tentative Report, the Conference Committee on Specifications and Tolerances has maintained continuing contact among its members through the medium of letter correspondence, and has given serious study and consideration to all comments and suggestions received on subjects included in the Tentative Report, and on other subjects within the jurisdiction of the Committee.

All day Sunday, June 2, and the afternoon of Monday, June 3, were given to open hearings. These were attended by many weights and measures officials and representatives of industry and business. The Committee is sincerely appreciative of the excellent attendance at its open meetings and for the many helpful suggestions made during those meetings. The Committee is of the opinion that it now has the benefit of the experience and advice of many qualified individuals and groups, and it is on the basis of those opinions and its own judgment that the following recommendations are offered for Conference consideration and action.

[Secretary's Note: As each individual recommendation or item was presented, it was moved and seconded that it be adopted. Such motions prevailed in all cases.]

GENERAL CODE

G-D. 18. PRIMARY INDICATING OR RECORDING ELEMENTS.—During the open meetings preceding this Conference, the Committee became aware that there exists considerable confusion in the interpretation of the meaning of the terms "Primary Indicating Element" and "Primary Recording Element." Accordingly it is recommended that paragraph G-D. 18 be amended to read as follows:

G-D. 18. PRIMARY INDICATING OR RECORDING ELEMENTS.—The term "primary" is applied to those principal indicating elements (visual) and recording elements that are designed to, or may, be used by the operator in the normal commercial use of a weighing or measuring device in which such elements are incorporated. The term "primary" is applied to any element or elements that may be the determining factor in arriving at the sale representation when the device is used commercially. (Examples of primary elements are the visual indicators on meters or scales not equipped with ticket printers or other recording elements, and both the visual indicators and the ticket printers or other recording elements on meters or scales so equipped.) The term "primary" is not applied to such auxiliary elements as, for example, the totalizing register or predetermined-stop mechanism on a meter or the means for producing a running record of successive weighing operations, these elements being supplementary to those that are the determining factors in sales representations of individual deliveries or weights.

1. *Maximum Value of Minimum Graduated Interval on Large-Capacity Scales.* This matter was treated in the Tentative Report of the Committee, wherein several possibilities were suggested. As a result of testimony presented during the open Committee hearing and a positive suggestion made by a group of large-capacity scale manufacturers, the Committee now recommends that there be added to the Scale Code nonretroactive regulations R. 4. 6., R. 4. 6. 1., R. 4. 6. 2., R. 4. 7., R. 4. 7. 1., and R. 4. 7. 2., as follows:

R. 4. 6. ON CRANE SCALES.

R. 4. 6. 1. WEIGHBEAM TYPE.—*The value of the minimum graduated interval on the weighbeam elements of a weighbeam-type crane scale shall be not greater than 0.05 percent of the nominal capacity of the scale.*

R. 4. 6. 2. AUTOMATIC-INDICATING TYPE.—*The value of the minimum graduated interval on the reading-face elements of an automatic-indicating type crane scale shall be not greater than 0.2 percent of the reading-face capacity.*

R. 4. 7. ON LARGE-CAPACITY SCALES OTHER THAN LIVESTOCK, ANIMAL, VEHICLE, WHEEL-LOAD, AXLE-LOAD, HAND-OPERATED GRAIN HOPPER, AND CRANE SCALES.

R. 4. 7. 1. WEIGHBEAM TYPE.—*The value of the minimum graduated interval on the main weighbeam elements and on the tare weighbeam elements of large-capacity scales other than livestock, animal, vehicle, wheel-load, axle-load, hand-operated grain hopper, and crane scales shall be not greater than 0.05 percent of the nominal capacity of the scale, or one-fourth pound, whichever is greater, and in any case not greater than 50 pounds.*

R. 4. 7. 2. AUTOMATIC-INDICATING TYPE.—*The value of the minimum graduated interval on the reading-face elements of large-capacity automatic-indicating scales other than livestock, animal, vehicle, wheel-load, axle-load, hand-operated grain hopper, and crane scales shall be not greater than 0.1 percent of the nominal capacity of the scale, or one-fourth pound, whichever is greater, and in any case not greater than 50 pounds.*

MR. SANDERS: Some of the scale manufacturers would like to suggest the changing of the word "nominal" in R. 4. 7. 2. to make it more definitive so it can be better understood. This was discussed when the recommendation came from this group. They would like to have the word "nominal" changed to something which would tie in with the chart capacity.

MR. GEHRINGER: I want to say that a lot of time has been spent on this matter. The manufacturers have been a little dilatory in doing the job that should have been done on it. The Specifications and Tolerances Committee has been very tolerant and has given us every opportunity. I think we were a little misguided on the first proposition that we put out. Understand, the scale manufacturers can meet these regulations very nicely. We are a little worried, however, that it will be possible, with the regulations as written, to have a very large graduation on a scale that is used to weigh commodities. For instance, on a hopper scale, it would be possible to include in the nominal capacity of the scale, counterpoise weights furnished with the scale. There could be a 50-pound dial graduation, by furnishing enough counterpoise weights. In weighing, the dial would be used at all times. We are concerned about that. We think it is too loose. We would like for the nominal capacity to be changed to either "total chart capacity," or "dial chart capacity, including drop weights." You may say that there is a similarity between "counterpoise weights" and "drop weights," but a drop weight will always indicate on a dial chart.

Basically, the manufacturers hope that the regulation can be changed to "chart capacity, including drop weights," rather than

"nominal capacity," which would then eliminate the use of "bottle weights," etc., in trying to increase the capacity, in order to obtain a large minimum graduation. That is basically what we are concerned about. As I say, we can meet these regulations. They are no trouble to us.

Is Mr. Hem of the Toledo Scale Company here? He was also in on this. We are throwing this out for your consideration.

(Mr. Hem did not respond.)

We pulled a fast one on the Specifications and Tolerances Committee by not getting in our final suggestions until very late this morning and I apologize for that.

MR. BAUCOM: Mr. Chairman, is there a motion before the house to change this regulation?

CHAIRMAN: No, just a suggestion.

MR. BAUCOM: I think the suggestion is well taken. It means a lot when you try to analyze it. Of course, it was brought up here very quickly, but it sounds good to me. I, therefore, move that we substitute Mr. Gehringer's version for the word "nominal" in this large-capacity scale regulation.

CHAIRMAN: We have had a motion and support to amend the committee recommendation. Mr. Baucom, state your amendment, please.

MR. BAUCOM: I move that we substitute for the word "nominal" the version that he recommended, "chart capacity with drop weights only."

MR. MEEK: This is a matter that the committee has had under study for more than a year. The scale industry requested last year that no definite language be written into the code because they wanted time to study it. They did come up with some suggestions a few months ago. Those suggestions were not the same as are incorporated into the specific language that we are now recommending. The recommendations that I have just read to you this morning were presented to the S&T Committee at its opening hearing by one of the scale people who said that he did represent eight of the largest scale manufacturers in the country. Not until I came into this room this morning did I know what the recommendations were that Mr. Gehringer has submitted to this Conference. I did not have an opportunity to get the committee together to consider his proposal. Gentlemen, I have never believed in acting hastily on an important matter.

I would like to point out that we have never before had any requirements in the code on the value of the minimum graduated intervals for the types of scales that this proposal is intended to cover. I certainly believe this to be a good start. Yes, they can meet the requirements and go beyond that, but certainly this is worth a trial period of at least one year. The S&T Committee can study this matter and consult with the scale people and come up with a further amendment if necessary. I would like to ask that the motion to amend be defeated.

CHAIRMAN: Any further comment? Are you ready for the question? We are voting on the amendment to the committee recommendation.

(Mr. Baucom's motion to amend was defeated.)

MR. BAUCOM: Mr. Chairman, I wish to speak on the committee motion. Gentlemen, we have operated for 30 years, to my knowledge, with a maximum graduation of 20 pounds. Here we are now changing all those minimum graduations if I understand it correctly. Have I got it wrong?

MR. MEEK: I am afraid you have, Mr. Baucom. This covers only the types of scales not heretofore covered. It does not change the others in any way.

MR. BAUCOM: What does the 50 pounds refer to?

MR. MEEK: To those scales that are not now, and never have been, covered in the present code.

MR. BAUCOM: Our definition of a large-capacity scale is 500 pounds. If you use it for certain purposes, would you get 50 pounds tolerance on a 500-pound scale? I am getting confused on the thing. I believe in small tolerances for devices and a large tolerance for human error, but I don't believe in large tolerances for mechanical error. I am getting confused.

MR. MEEK: I might call your attention to R. 4. 7. and ask you to read it again. The scales named therein are presently covered by the code and are specifically excluded from these new amendments. It would not change the requirements for those particular types of scales in the least. Those that are now 20 pounds will remain 20 pounds.

MR. BAUCOM: All right. I will withdraw my comments.

(The motion to adopt the committee recommendation carried.)

2. *Specific Requirements for Automatic Hopper Scales.* Under the terms of Handbook 44, automatic hopper scales are covered, but without specific mention. In order that such scales be covered specifically, the following recommendations are made:

Add a new definition for automatic grain hopper scales, to be numbered D. 25. 2., and renumber and modify the side title of present definition D. 25. so that the definitions for grain hopper scales will read as follows:

D. 25. HOPPER SCALES.

D. 25. 1. HAND-OPERATED GRAIN.—One adapted to the manual weighing of variable loads of grain.

D. 25. 2. AUTOMATIC.—One adapted to the automatic weighing of bulk commodity in successive drafts of predetermined amounts. (This is not an "automatic-indicating scale" as defined in D. 7.)

Add a new paragraph, to be numbered P. 1. 2. 6., and to read as follows:

P. 1. 2. 6. FOR AUTOMATIC HOPPER SCALES.—The maximum maintenance SR shall be (a) 0.15 percent of the minimum draft the scale is designed to weigh automatically, (b) the value of two of the minimum graduated intervals on the weighbeam, or (c) 40 pounds, whichever is less. The maximum acceptance SR shall be one-half the maximum maintenance SR. (On a scale the capacity of which is rated in bushels, the "minimum draft the scale is designed to weigh automatically" is computed on the basis of 30 pounds per bushel.)

And add "P. 1. 2. 6." to the series of exceptions in P. 1. 2. 1.

3. *Statement of Tolerances for Small-Capacity Scales in Decimal Fractions of Pounds.* There are now being manufactured and sold, small-capacity scales with indicating elements graduated in decimal fractions of the pound rather than, as has been customary, in ounces and fractions of ounces. In order to facilitate the work of inspectors

testing scales of this type, the Committee recommends an amendment to Table 6 that merely supplements the values now shown, by adding equivalent values in the decimal system, as follows:

TABLE 6. BASIC MAINTENANCE TOLERANCES, ON UNDERREGISTRATION AND ON OVER-REGISTRATION, FOR SMALL-CAPACITY SCALES, EXCEPT UNCOMPENSATED SPRING SCALES, PRESCRIPTION SCALES, JEWELERS' SCALES, CREAM-TEST SCALES, AND MOISTURE-TEST SCALES

Known test load	Tolerance on ratio test		Tolerance on weigh-beam, reading-face, and unit-weight indications	
lb	oz	lb	oz	lb
1	$\frac{1}{16}$	0.004	$\frac{1}{16}$	0.004
2 and 3	$\frac{1}{16}$	.004	$\frac{1}{8}$	.008
4 to 7, incl.	$\frac{1}{8}$	.008	$\frac{3}{16}$	.012
8 to 14, incl.	$\frac{1}{4}$	.016	$\frac{3}{8}$	.023
15 to 23, incl.	$\frac{5}{16}$	.020	$\frac{1}{2}$	.031
24 to 29, incl.	$\frac{3}{8}$	.023	$\frac{1}{2}$	.031
30 to 39, incl.	$\frac{3}{8}$	.023	$\frac{5}{16}$	.039
40 to 49, incl.	$\frac{7}{16}$	.027	$\frac{5}{8}$	.039
50 to 59, incl.	$\frac{1}{2}$	.031	$\frac{3}{4}$	.047
60 to 74, incl.	$\frac{5}{8}$	.039	1	.062
75 to 89, incl.	$\frac{3}{4}$	.047	1	.062
90 to 99 incl.	$\frac{7}{8}$	.055	$1\frac{1}{4}$	.078
100 and over	1 oz per 100 lb	.062 lb per 100 lb	$1\frac{1}{2}$ oz per 100 lb	.094 lb per 100 lb

4. *Uncompensated Spring Scales.* Several manufacturers of spring scales have informed the Committee that, because of critical material shortages, they will be unable to furnish scales in compliance with the tolerance requirements of table 6 of the Scale Code if, as now provided, table 7 is deleted on July 1, 1957. The Committee is reluctant to recommend a postponement of this effective date; however, it is constrained, by force of circumstance, from adhering to the original date and thus throwing the scale industry into a state of confusion.

The Committee feels that, with due diligence on the part of the spring scale manufacturers, this situation can surely be corrected within the next twelve months, and accordingly recommends as follows:

Change "1957" to "1958" wherever it appears in paragraphs D. 10., T. 1. 3. 2. (including table 7), and R. 5.

LIQUID-MEASURING DEVICE CODE

1. *S. 3. 6. Unit-Price Indication.*—The 41st National Conference, in 1956, amended the text of paragraph S. 3. 6. of the Liquid-Measuring Device Code, expanding, to some extent, the coverage of this specification. The side title of this paragraph should also have been expanded to better describe the contents. The Committee recommends that the side title of paragraph S. 3. 6. be amended to read as follows:

S. 3. 6. UNIT-PRICE AND PRODUCT-IDENTITY DISPLAY.

2. *"Visigages."*—In its report to the 41st National Conference, the Committee recommended the deletion of specification S. 10. 2. INI-

TIAL OPERATING CONDITION. The Conference voted down this recommendation of the Committee. Nothing has been brought to the attention of the Committee that has caused it to change its opinion on this matter—an opinion expressed in its report in 1956, a part of which is quoted below:

Having determined that the "visigage" provides little or no service to the weights and measures official, and practically no protection to the consumer, and that the customer pays little or no attention to its existence, the Committee recommends that paragraph S. 10.2. of the Code for Liquid-Measuring Devices be deleted, and that paragraph S. 10.3. be renumbered to become S. 10.2.

Although the above-quoted paragraph still expresses the sentiment of the Committee, it believes it improper for it to recommend a reversal of last year's Conference action with respect to this specification and that any proposal for such reversal must come from the floor of the Conference.

MR. KERLIN: Mr. Chairman, at this time I should like to offer a motion to the effect that the Liquid-Measuring Device Code be amended by deleting paragraph S. 10.2. and renumbering paragraph S. 10.3 as S. 10.2., and thus removing the requirement for so-called "visigages" on retail motor-fuel devices. This motion is in accordance with a 1956 recommendation of the Conference Committee on Specifications and Tolerances, and, Mr. Chairman, I so move.

(The motion was seconded.)

MR. WRIGHT: Mr. Chairman, I would like to make a statement in connection with Mr. Kerlin's motion. Last year, as you know, the Specifications and Tolerances Committee did recommend that the requirement of the visigage or sight glass be eliminated. At the time of that motion, on a rising vote, the proposal was defeated by this Conference. The objection offered by those who wanted to retain the visigage was "we are not convinced that the visigage does not render service."

Personally, I have no quarrel with that. What I am trying to do now is to simply lay a statement before you representing the views of the gasoline pump manufacturers to indicate that its usefulness has passed. There are two general aspects to this problem, one concerning quantity, or measurement, and the other has to do with quality. We are concerned here with quantity and measurement but not with quality. We had a demonstration in this hotel last Tuesday that showed that the computer head on the pump would indicate a void. It will do what the visigage would do. We have had a number of meetings throughout the year, with your various weights and measures groups, and we have tried to lay before you a statement of the gasoline pump manufacturers' and industry's position. I speak only for the gasoline pump manufacturers.

Mr. Birkin, Chairman of the Committee of the A. P. I., is here and can supplement what I have to say. This concerns the actual manufacture of the pump. We have made available a record of the meeting where this was discussed. That record covers almost every point concerning the visigage. Mr. J. T. Kennedy, whose experience and opinions I thoroughly respect, has pointed out that if the hose is drained, the visigage would show a void. He is correct in this statement, although there are conditions, which have been demonstrated at this Conference, where the hose was drained and it did not show up on the visigage. The visigage, itself, has outlived its usefulness. It

is an obsolete part of the equipment. Everything that it does, from the standpoint of weights and measures, is fully protected by the computer jump. It seems to be an unnecessary burden upon the manufacturer and the user of pumps to leave the visigage in the pump. We, therefore, want to express our endorsement of Mr. Kerlin's motion and ask that you support it in your voting.

MR. J. T. KENNEDY: Mr. Chairman, I am going to get in Dutch. The industry is going to be surprised and my good friends in weights and measures are going to be surprised. Since last year, very secretly, I have conducted an investigation. After the last Conference, Mr. Theon Wright wrote a very hot article. He criticized Massachusetts, Maryland, District of Columbia, North Carolina, and some others because they flooded the meeting with votes. This year I want to say to everybody here that my men—I have got a few here—have been told that they may vote as they see fit. They have a right to vote for or against the visigage. I don't care which. I have conducted a valid investigation, strictly from a weights and measures angle.

The last one I questioned was my wife. I said, "Do you know what a visigage is?" She said, "What?" I said, "A visigage." She said, "No, I don't know what it is."

Recently there were some men in my office and I asked them if they knew what a visigage was and they said, "Yes, it is that thing that spins around." I said, "What does it mean?" They said, "Nothing."

I hate to say this because last year, and two years ago, I got up and I argued. I guess I have to pull in my wings. If I should vote to retain the visigage I believe my 12 or 13 men would vote for its elimination. As far as I am concerned I do not require the visigage from now on.

MR. McBRIDE: I think it has been fairly demonstrated to the membership here as to what the use of the visigage is now. It had a useful period sometime back, but in view of other things, the visigage has perhaps become ornamental. I had sort of a hidden reason that I hoped it might be retained. I also recognize that I have no right to expect its retention. I recognize that it is no longer of any great value.

MR. J. T. KENNEDY: Mr. Chairman, I would like to ask for a rising vote.

DR. LASHOF: Can you see the computer jump just as you see the visigage?

(The answer coming from the floor was "Yes.")

MR. J. T. KENNEDY: I said I made a personal investigation. I don't believe in the computer jump. The fill tank is on the right hand side of the rear fender of my car. I have tried my best to get out of the car in time to see that computer jump. In the last three months I have never succeeded. Whether the computer jumps or not, I don't know; but the visigage, as it is today, is no good to anybody who is going to look at it because it is too cloudy.

MR. BAUCOM: Mr. Chairman, I want to explain my vote. Our law says that any reprehensible practice shall be prohibited, but I have not supported the visigage requirement on that basis. I am supporting it in defense of the operator whom I am going to put in jail if he gives short measure. How does the operator know his pump is working properly without some visible means? The jump is not

sufficient. I do not accept that as being a cure-all. As far as North Carolina is concerned, you will have to continue to put the visigage on it until you come up with something better.

The pump companies should have offered something as a substitute which is better and that will carry out the original intent. I have no alternative. It is written in my law that visible means shall be provided for showing the proper working condition. I will have to get the law changed, and it will take 2 years, if not 4 or 6, to do that. So you will just have to go along with it.

(On a rising vote, Mr. Kerlin's motion was adopted 64 to 41.)

3. N. 1. 3. Special Tests.—To make the requirements of the last sentence in paragraph N. 1. 3. completely consistent, amend the sentence by changing the figure "50" to "75" both times it appears.

TOLERANCES FOR WHOLESALE LIQUID-MEASURING DEVICES—VEHICLE-TANK METERS

As requested by the Conference, the Committee has studied the tolerance structures for wholesale liquid-measuring devices and vehicle-tank meters. For the information of the Committee during the planning stages of the study, data pertaining to testing equipment and procedures were requested of and received from many jurisdictions. Such information was helpful to the Committee in its consideration of the problem and in its analysis of current equipment and practices. The Committee learned that in many instances there still exists an insufficiency of adequate testing equipment and that there are wide variations in test methods.

For specific information with respect to meter performance, a definite study was planned. This study consisted of a series of precise tests conducted in six separate areas, each representing a weights and measures jurisdiction, under normal field conditions. The purpose of the tests was to determine, quantitatively, the actual departures from zero error in commercial devices when these are tested according to recommended procedures.

The jurisdictions selected were chosen because (1) they were geographically convenient for the conduct of the survey, (2) they are equipped with adequate testing equipment for testing the devices, and (3) they are conducting regular testing programs on the devices. In order that any variations in standards would not affect the results, the standards of the jurisdictions were used in the tests.

All tests were conducted by a staff member of the National Bureau of Standards, with the assistance of at least one weights and measures official from the jurisdiction in which the tests were made, and the following procedures were adhered to in every detail:

For Vehicle-Tank Meters

1. Wet prover and drain prescribed period.
2. 100-gallon full flow (normal operating rate).
3. Repeat 100-gallon full flow.
4. 100-gallon slow (as per N. 2. 1., Vehicle-Tank Code).
5. Repeat 100-gallon slow.
6. 100-gallon split compartment. (Test was started drawing from a compartment with less than 100 gallons of product. When lack of product caused the meter to stop completely, supply line to the empty compartment was closed and, as nearly simultaneously as practicable, the supply line to a full compartment was opened.)

For Loading Rack Meters

1. Wet prover and drain prescribed period.
2. Either 500- or 750-gallon (depending on size of prover used in the jurisdiction) full flow.
3. Repeat full flow.
4. Either 500- or 750-gallon slow (as per N. 1. 3., Liquid-Measuring Device Code).
5. If large difference between slow test and full flow test, repeat slow test.

All operating conditions were carefully controlled during the tests. A $\frac{1}{5}$ -second stop watch was used to determine rate of flow. The results of the tests are summarized below.

Vehicle-Tank Meters. 50 meters tested.

Normal Test. Average numerical error without regard to signs (+ or -) was 46.7 cubic inches, whereas the average error when signs are considered was -5.2 cubic inches on 100-gallon test.

Thirty of 50 meters had minus error with average of -43.3 cubic inches.

Twenty of 50 meters had + error with average of +51.9 cubic inches.

Slow Flow Test. Average numerical error without regard to signs was 62.1 cubic inches, whereas average error when signs are considered was -9.2 cubic inches on 100-gallon test.

Thirty of 54 meters had minus error with average of -59.4 cubic inches.

Twenty of 50 meters had + error with average of +66.2 cubic inches.

Split-Compartment Test. (Nine of the 50 meters were installed on single-compartment units; thus, split-compartment test could be applied to only 41.)

Average numerical error without regard to signs was 141.8 cubic inches, whereas average error when signs are considered was -97.7 cubic inches on 100-gallon test.

Twenty-nine of 41 meters had minus error with average of -169.3 cubic inches.

Twelve of 41 meters had + error with average of +75.4 cubic inches.

Tolerance Summary. Of 50 meters tested with 100-gallon prover:

Twenty-seven or 50 percent were found to perform within present maintenance tolerances.

Twenty-three or 46 percent were found to be outside present maintenance tolerances.

(If tolerances, both "normal" and "special," were to be reduced by one-half, as has been suggested, 15 more meters would be outside present maintenance tolerances, thus making 16 percent in tolerance, 84 percent outside tolerance.)

Loading Rack Meters. 37 meters tested.

Normal Test. Average numerical error without regard to signs (+ or -) was 0.42 cubic inch *per gallon of test*, whereas the average error when signs are considered was -0.19 cubic inch *per gallon of test*.

Twenty-five of 37 meters had minus error with average of -0.45 cubic inch *per gallon of test*.

Twelve of 37 meters had + error with average of +0.35 cubic inch *per gallon of test*.

Slow Flow Test. 34 meters tested.

Average numerical error without regard to signs (+ or -) was 0.66 cubic inch *per gallon of test*, whereas the average error when signs are considered was -0.34 cubic inch *per gallon of test*.

Twenty-three of 34 meters had minus error with average of -0.51 cubic inch *per gallon of test*.

Eleven of 34 meters had + error with average of +0.99 cubic inch *per gallon of test*.

Tolerance Summary. Of 37 meters tested:

Twenty-five or 68 percent were found to perform within present maintenance tolerances.

Twelve or 32 percent were found to be outside present maintenance tolerances.

(If tolerances, both "normal" and "special," were to be reduced by one-half, 12 more meters would be outside present maintenance tolerances, thus making 35 percent in tolerance, 65 percent outside tolerance.)

The foregoing data show that, in the six representative jurisdictions in which this survey was carried out, 46 percent of the vehicle-tank meters and 32 percent of the wholesale liquid-measuring devices tested were found to be outside the maintenance tolerances prescribed in Handbook 44. In view of this situation, the Committee recommends that no changes be made in the tolerance structures in either the Vehicle-Tank Code or the Liquid-Measuring Device Code.

The Committee further recommends that weights and measures officials direct their attention to the strict application of recommended testing procedures as described in Handbook 45 and outlined above. It is to be emphasized in this connection that any tolerance structure covering performance of a mechanical device must be based upon a certain specific testing procedure, and that the tolerances are effective only when the prescribed testing pattern is rigidly adhered to.

VEHICLE-TANK CODE

1. *S. 10.7. Manifold.*—To comply with a specific request of the National Tank Truck Carriers, Inc., amend paragraph S. 10.7. by deleting from line 3 the words "and automatic".

2. *Manifold Hookup of Power-Discharge Metering Systems.*—During the revision of the Vehicle Tank Code in 1955, it was pointed out to the Committee that in many instances the air elimination system in pump-discharge units was not satisfactorily effective. It was contended that, as a result of this condition, short measure was given to consumers when ordinary split-compartment deliveries were made, even though the dispensing meters performed within tolerance on normal tests.

In attempting to provide a solution of this problem, the Conference adopted paragraph S. 20.4., which reads as follows:

S. 20.4. MANIFOLD.—*On a pump-discharge unit, when two or more compartments discharge through a common manifold or other single outlet, effective and automatic means shall be provided to insure that liquid can flow through the delivery line leading from only one compartment at one time and cannot flow from one compartment into another compartment.*

The Committee is now informed that, while there are many metering systems in use on vehicle tanks today in which the air elimination system is not satisfactorily effective, metering systems are being built that are efficient without the installation of selector-type valves. The Committee cannot now justify a selector-valve provision that is applicable to all pump discharge systems when it has been found that the accuracy performance of the system would not be improved as a result of the installation of such valves.

The Committee feels that the only true criterion in approval or rejection of vehicle-tank metering systems with manifold hookups is in the application of appropriate testing procedures; accordingly it is recommended that paragraph S. 20.4. be deleted.

3. *Primary Indicating and Recording Elements.*—The matter of zero-return of recording elements on vehicle-tank meters was discussed at length in the Tentative Report. Although the Committee is still of the opinion that the principle of zero start for commercial devices used for deliveries to consumers is sound, testimony has been presented indicating an overwhelming sentiment among weights and measures officials and equipment manufacturers and users in support of the official recognition and acceptance of accumulative printing elements on vehicle-tank meters, even when these are used for deliveries to consumers.

Faced with this situation, and recognizing the futility of insisting on adherence to the stated principle in the face of such overwhelming sentiment, the Committee reluctantly recommends, as a matter of practical expediency, that the Vehicle-Tank Code be so amended as to allow accumulative printing elements. However, the Committee is convinced that all vehicle-tank meters must be equipped with visual primary-indicating elements, whether or not such meters are equipped with ticket-printing elements.

In this relation, the Committee is constrained to record its commendation of the one or more weights and measures administrators who have adhered strictly to the current provisions of Handbook 44—2d Edition, under which it is required that ticket printers on vehicle-tank meters used for consumer deliveries be returnable to zero. The recommendations immediately following are in no sense to be construed as any reflection upon the judgment of such administrators or as any repudiation of their strict adherence to code requirements.

To implement the Committee's decision, it is recommended that the Code for Vehicle Tanks be amended as follows:

Paragraph S. 21.1.1.—Change side title and first sentence so that the paragraph will read as follows:

S. 21.1.1. **CHARACTER AND TERMS OF INDICATION.**—Meters shall be equipped with visual primary indicating elements and these shall indicate in terms of gallons. The value of the smallest unit of indicated delivery on a meter used for retail deliveries of liquid fuel for domestic use shall not exceed 1 pint, and on other meters shall not exceed 1 gallon. Fractional parts of the gallon shall be indicated in terms of either decimal or binary subdivisions.

Paragraph S. 21.1.4.—Amend to read as follows:

S. 21.1.4. **MOVEMENT AND RETURN TO ZERO.**—Primary indicating elements and primary recording elements shall be susceptible of advancement only by the mechanical operation of the meter. Visual primary indicating elements shall be readily returnable to a definite zero indication, and means shall be provided to prevent the return of these elements beyond their correct zero position. If primary recording elements are returnable to a zero position, means shall be provided to prevent the return of these elements beyond a definite and correct zero position. However, a meter may be cleared by advancing its elements to zero, but only if the movement, once started, cannot be interrupted, or if the indications are automatically obscured until the elements reach zero position.

Paragraph R. 3.—Amend to read as follows:

R. 3. **RETURN OF INDICATING AND RECORDING ELEMENTS TO ZERO.**—The primary indicating elements (visual), and the primary recording elements when these are returnable to zero, shall be returned to zero before each delivery.

In the preparation of Handbook 44—2d Edition, the effort was to make the Code for Vehicle Tanks complete within itself (with the exception of General Code requirements) and thus eliminate the previously existing necessity for cross referencing to the Liquid-Measuring Device Code. Regulation R. 1. 3. **DISCHARGE RATE**, of the Liquid-Measuring Device Code should have been repeated in the Vehicle-Tank Code, but, through oversight, this paragraph was omitted. Accordingly, the Committee recommends a new paragraph R. 4. be added to read as follows:

R. 4. **DISCHARGE RATE.**—A meter shall be so installed that the actual maximum discharge rate will not exceed the rated maximum discharge rate; if necessary, means for flow regulation shall be incorporated in the installation, in which case this shall be fully effective and automatic in operation.

MR. J. T. KENNEDY: Mr. Chairman, I am very glad Mr. Harris followed the Handbook, for that developed into what is brought out

today. I believe the committee was very wise in commending Mr. Harris. I want to say he is doing a very good job in Virginia. We differed in three places. I adopted two of the differences. We did not use the tenths and he had a delivery test far superior to ours. I think Mr. Harris is to be complimented on the job he and his staff are doing in Virginia.

TENTATIVE CODE FOR LIQUEFIED PETROLEUM GAS LIQUID-MEASURING DEVICES

Pending the development of automatic means for controlling the blow-off valve and indicating its setting, as contemplated by the non-retroactive portion of specification S. 2. 2., amend this specification by striking out the word "automatic," making paragraph S. 2. 2. read as follows:

S. 2. 2. DIVERSION OF MEASURED LIQUID.—No means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or the discharge line therefrom, except that a manually controlled outlet that may be opened for the purpose of emptying a portion of the system to allow for repair and maintenance operations shall be permitted; *effective July 1, 1957, effective means shall be provided to prevent the passage of liquid through any such outlet during normal operation of the device and to indicate clearly and unmistakably when the valve controls are so set as to permit passage of liquid through such outlet.*

To correct an oversight that occurred in the preparation of paragraph N. 2. 3., add a new sentence to read:

A retail device other than a motor-fuel device shall be so tested at a minimum discharge rate of (a) 50 percent of the maximum discharge rate developed under the conditions of installation or (b) the minimum discharge rate marked on the device, whichever is less.

To make the terms of the last sentence of this paragraph completely consistent, change the figure "15" to "10" where it occurs in this sentence, making paragraph N. 2. 3. read as follows:

N. 2. 3. SPECIAL TESTS.—"Special" tests, to develop the operating characteristics of meters and meter-type devices, shall be made as circumstances require. A motor-fuel device shall be so tested at a minimum discharge rate of (a) 5 gallons per minute or (b) the minimum discharge rate marked on the device, whichever is less. A retail device other than a motor-fuel device shall be so tested at a minimum discharge rate of (a) 50 percent of the maximum discharge rate developed under the conditions of installation or (b) the minimum discharge rate marked on the device, whichever is less. A wholesale device shall be so tested at a minimum discharge rate of (a) 10 gallons per minute for a device with a rated maximum discharge less than 50 gallons per minute, (b) 20 percent of the marked maximum discharge rate for a device with a rated maximum discharge of 50 gallons per minute or more, or (c) the minimum discharge rate marked on the device, whichever is less.

Delete from the code present paragraph R. 5. and the parenthetical note at the end of the code, and add at the end of the code a "General Note" reading as follows:

General Note

The National Conference records its conviction that, to assure consistently accurate net deliveries of products and complete customer protection, deliveries of liquefied petroleum gas through fluid meters must be made without the use of vapor-return or pressure-equalizing lines connecting the customer's tank with the supplier's tank, and that an appropriate regulation dealing with this matter, designed to accomplish the desired purpose, should ultimately be included in the Code for Liquefied Petroleum Gas Liquid-Measuring Devices. The Conference feels, however, that, since studies and experiments in this area are incomplete and are being currently continued, it would be premature at this time to offer such a regulation for official adoption by the States. The Conference suggests,

therefore, that, when it has been demonstrated that deliveries of liquefied petroleum gas can successfully be made without vapor return lines and without unreasonable hardship to buyer or seller, steps be taken to add the following regulation, or one designed to accomplish the same purpose, to the Code for Liquefied Petroleum Gas Liquid-Measuring Devices:

R. 5. VAPOR RETURN LINE.—During any metered delivery of liquefied petroleum gas from a supplier's tank to a customer's receiving container, there shall be no vapor return line from the customer's container to the supplier's tank:

- (a) In the case of any customer's container to which normal deliveries can be made without the use of such vapor return line.
- (b) In the case of any customer's container installed after July 1, 19—
- (c) Effective July 1, 19—, in the case of any customer's container.

In order that the Liquefied Petroleum Gas Liquid-Measuring Device Code will provide the same requirements as the Vehicle-Tank Code with respect to the zero-return stipulation, amend the Code for Liquefied Petroleum Gas Liquid-Measuring Devices as follows:

Paragraph S. 3. 2.—Amend to read as follows:

S. 3. 2. CHARACTER OF INDICATION.—A device installed on a vehicle tank and, in addition, any retail device shall be equipped with a visual primary indicating element and this element shall show *its initial zero condition* and the amounts delivered up to the nominal capacity of the device.

Paragraph S. 3. 4.—Amend to read as follows:

S. 3. 4. ADVANCEMENT AND RETURN TO ZERO.—Primary indicating elements and primary recording elements shall be susceptible of advancement only by the mechanical operation of the device. Visual primary indicating elements shall be readily returnable to a definite zero indication, and means shall be provided to prevent the return of these elements beyond their correct zero position. If primary recording elements are returnable to a zero position, means shall be provided to prevent the return of these elements beyond a definite and correct zero position. However, a device may be cleared by advancing its elements to zero, but only if the movement, once started, cannot be interrupted, or if the indications are automatically obscured until the elements reach zero position.

Paragraph R. 4.—Amend to read as follows:

R. 4. RETURN OF INDICATING AND RECORDING ELEMENTS TO ZERO.—The primary indicating elements (visual), and the primary recording elements when these are returnable to zero, shall be returned to zero before each delivery.

MR. TUCKER: Those of us in industry are wholly in accord with recommendations made by the committee, but do have this one question with regard to the general note found on page 14 of the final report. We question whether or not the wording is appropriate to a standard and whether or not it should be included in a standard. We feel that it is quite appropriate in the Conference proceedings, but wonder whether or not it is a matter for incorporation in a standard.

MR. BAUCOM: I feel that probably the committee is anxious to project its thinking and support to future legislation. I think this is more or less superfluous at this time. We cannot bind any future Conference to acceptance of anything, and, therefore, I think that could be left off. I move that Section R. 5.8. be deleted from the code. Leave the note, but there is no need of writing out what we want to adopt next year or at some future date. I think that will come at the proper time. We can't make it binding, so why put it in? Therefore, I so move that that be deleted from the code, but leave the general note as it is.

CHAIRMAN: There seems to be no support to that motion; therefore I think we are ready for the question.

MR. TUCKER: Our only point was that we think there should be carried in the minutes and the proceedings of the Conference, the committee feeling and its convictions, but we do not think this is the place to record the committee's convictions. We just don't think it is a matter to be printed in H44, which contains the standards that become rules and regulations.

CHAIRMAN: There is still no second to Mr. Baucom's motion, so I think we are ready for the original question.

(Motion carried.)

MR. MEEK: My motion now is for the final adoption of the Tentative Code for Liquefied Petroleum Gas Liquid-Measuring Devices, as amended, and that it be incorporated in Handbook 44.

(Motion carried.)

CODE FOR MILEAGE-MEASURING DEVICES

A recent development in taximeters substitutes a control knob for the conventional lever arm and flag, for the purpose of setting the operating condition of the mechanism and of clearing the taximeter. This design appears to be acceptable, but is not in compliance with the present code. To admit this new design, substitute for paragraph S. 16. the following:

S. 16. CONTROL FOR OPERATING CONDITION.

S. 16.1. MEANS AND MOVEMENT.—A control-lever arm, knob, handle, or other convenient and effective means shall be provided to set the taximeter mechanism for the desired operating condition, and to "clear" the taximeter. The several positions of this control shall be mechanically defined, and displacement from any one of these positions shall be sufficiently obstructed that the accidental or inadvertent changing of the operating condition of the taximeter is improbable. Possible movement of this control to an operating position immediately following its movement to the cleared position shall automatically be delayed enough to permit the taximeter mechanism to come to complete rest in the cleared condition.

S. 16.2. FLAG.—If the control for the operating condition is a lever arm and flag, the flag shall be at its highest position when the taximeter is cleared, and in this position the whole of the flag shall be above the level of the taximeter housing.

MR. MEEK: Mr. Chairman, I move that the complete report of the Conference Committee on Specifications and Tolerances, including both the tentative and final reports, as presented, and as amended from the floor, be adopted as a whole.

(Motion carried.)

MR. MEEK: This is my swan song as a member of the S&T Committee. It has been a great pleasure to work with the committee, and I hope that you will extend to my successor the wonderful cooperation I have received during the past five years.

MR. RUMOSHOSKY: As one of the industry representatives, I want to say we are sorry to see Rollin Meek stepping down. We feel that he has been outstanding and hope his successor will be just as good.

FIFTH SESSION—AFTERNOON OF THURSDAY, JUNE 6, 1957

(J. C. GOLL, VICE PRESIDENT, PRESIDING)

WEIGHTS AND MEASURES PROGRESS IN PUERTO RICO

By A. E. DIAZ, *Head, Division of Weights and Measures, Economic Stabilization Administration, Commonwealth of Puerto Rico*

Puerto Rico is an island approximately 100 miles long and 35 miles wide, faced with a combination of high population and limited natural resources. A few statistics will serve to indicate the severity of these problems. From 1899 to 1950 the population of Puerto Rico increased from less than 1 million to 2.2 millions. In the same 51-year period the number of workers employed in agriculture has slightly increased from about 200,000 to approximately 232,000. A percentage of the balance of the labor force has found employment in manufacturing. In 1950 the total labor force was estimated at 786,000.

Puerto Rico's per capita income in that year (1950) was about one-fifth that of the United States and considerably less than one-half that of the lowest ranking State, Mississippi.

Against this background, the Island has been seeking a solution that will keep under control unemployment, illiteracy, and related programs, and at the same time foster production, efficiency, and democracy. As one segment of a broad reform and industrialization program, the Industrial Incentive Act provides a straight 10-year tax exemption—measured from the date of start of operations—for qualifying new firms. By providing for a full 10-year exemption for each qualifier, this law is to assist in attaining Puerto Rico's goal of 66,000 additional industrial jobs by 1960. To reach this goal, Puerto Rico entertains realistic expectations of attracting diverse industries and \$250,000,000 of private-capital investment. At this point, we wish to clarify that the Industrial Incentive Act does not countenance flight capital for investments here if it implies uprooting factories or impairing production in the Mainland.

Sugar, for a good number of years the backbone of Puerto Rico's economy, has been eclipsed by this industrial development program, known as "Operation Bootstrap." Since the beginning of this "Operation," 584 new manufacturing plants have been established and 35,000 new jobs created.

Meanwhile, a climax of political events led to the creation of the Commonwealth of Puerto Rico, a form of government unique in American political history. In internal structure the Commonwealth is, in some ways, like a State of the Union, and in some ways quite different. It originated in a compact between the Congress of the United States and the people of Puerto Rico. In several other ways our Commonwealth varies markedly from the status of the federated

States. No taxes are collected for the benefit of the Treasury of the United States. There is no voting representation in the Federal Congress, but rather a commissioner, accredited before the Department of State, who has a seat in the House of Representatives, with the privileges of speech and introducing bills, but without voting rights. Some Federal legislation, with the indicated exception of tax legislation, takes effect in Puerto Rico as in the States, in such areas as determined in the compact, but Congress is not under obligation to extend the application of any law to Puerto Rico. A last and profound difference is that, while federated statehood is irrevocable, commonwealth status can be changed, although not unilaterally, because of the nature of the compact and the principle of consent. We know that it will never be changed for the worse.

The progressive changes we have been undergoing are not limited to politics and economics. Quite a number of other fields have also been affected. For instance, over 400 new factories have been established since the end of the Second World War. Life expectancy has arisen from 46 years in 1940 to 61 years in 1952. Malaria has been practically eliminated and the tuberculosis rate has been dramatically reduced.

I am proud to repeat the following paragraph from a speech delivered last year by Governor Munoz of Puerto Rico to the Annual Convention of the Associated Harvard Clubs:

A few figures may tell of what the people of Puerto Rico have tried to accomplish in the last 15 years. In 1940, our net income was 230 million dollars. It is today nearly a billion, with a real increase of 107 percent. Production has been doubled and our income per capita is now \$435, higher than all of the Latin American countries, with the exception of Venezuela. We had 300,000 students in 1940; now we have more than 600,000, and illiteracy has been reduced from 32 to 20 percent in the same period, while an active campaign is underway to wipe out this curse altogether.

The history of weights and measures administration in Puerto Rico has not lagged behind amidst all these advancements. Let us examine it very broadly: Until July 1, 1955, Puerto Rico's Bureau of Weights and Measures was under the supervision of the Public Service Commission. Among its duties, this Commission had the responsibility for continuous supervision and coordination of the existing contractual relationship between sugar croppers and the sugar mills. As Puerto Rico's economy was a sugar economy, the services rendered by the Bureau of Weights and Measures to the sugar industry were considered paramount. Thus, it was considered advisable that the Bureau should be under the direct supervision of the Public Service Commission.

In order to check inflationary trends present after the Federal controls were eliminated, the Commonwealth Legislature created, in 1953, the Economic Stabilization Administration. This Administration is responsible for a rent control program covering units used for housing and business purposes, a selective price control program to correct certain price maladjustments, and a Consumers Education Program. Because of the character of these functions, weights and measures administration seems to be more properly placed within the scope of the Economic Stabilization Administration. On July 1, 1955, the Commonwealth Legislature transferred the Bureau of Weights and Measures to this Administration.

By that time, contact was made with the Office of Weights and Measures of the National Bureau of Standards for enlisting their help in working out a plan for the reorganization of our weights and measures program to insure its maximum effectiveness. A series of planning conferences were held.

Mr. Ralph W. Smith of the National Bureau of Standards visited Puerto Rico from November 28 through December 10, 1955, for the purpose of acquiring first-hand knowledge of the commercial and industrial conditions that prevail, the types of commercial equipment in use, the testing facilities available, and any special problems or conditions that might affect the organization and administration of a weights and measures program. As a result of this survey, a detailed report on the organization of a weights and measures service in Puerto Rico was made by the National Bureau of Standards. Based on the recommendations included in their report, we initiated the reorganization of our service.

Two members of our staff were sent to the National Bureau of Standards for a four-week training program, covering the technical and administrative aspects. Valuable cooperation in this training program was given by the offices of Weights and Measures of the City of Alexandria, the City of Yonkers, New York, and of the States of Virginia and New York.

The Office of Weights and Measures was rated as a Division, placing it at par with the two other major units operating in the Economic Stabilization Administration. With this action, appropriate recognition was given to weights and measures activities, commensurate with their economic importance.

The Commonwealth was divided into 5 district offices. At present, we have 2 inspectors assigned to each office, except the central office, which has 8 inspectors. Each office submits a weekly plan of work. The objective is to conduct a program that will systematically cover each district at least once a year.

Adequate report forms were designed for recording findings on inspections and testing, for check-weighing, and for keeping data of cases taken to court. A simple filing system was established by which records classified by municipalities follow alphabetical order. The field supervisor is conducting an intensive supervision program throughout the island. Administrative procedures are corrected and improved whenever the supervisor's report shows findings that require revision in procedures or program.

All prosecutions are cleared with and directed by the head office in coordination with the Chief Counsel of the Administration. A special attorney is available for the presentation of cases taken to court. During the year 1955-56 we filed 547 prosecutions, most of them for violations consisting of short weight, failure to declare contents on packages, or use of incorrect weight, measure, or weighing and measuring devices.

Our present statute makes it mandatory to take judicial action for every violation. We feel that this provision does not allow for the desirable discrimination that should be permitted for the enforcement of the law and regulations. This discrimination has not been very active during the preceding years. In those cases, we start with inspection and testing supplemented with an educational campaign.

Press releases, radio programs, lectures, and talks to operators are some of the means to tell the weights and measures story. In this respect we have the cooperation of our Public Relations Office and of the Consumers Education Program.

This initial effort toward education has elicited an immediate response from the public. The public is more conscious of our program. Labor groups are requesting inspection and testing of weighing and measuring devices when their pay is based on weight or measure determinations, like in the sugar cane and in the coffee harvest. Consumers call or write to our office to inform about irregularities observed by them.

In the field of importations, we have "sold" our services too, as a result of the educational campaign. Any importer can request from us a certificate of net weight, measure, or count on a particular shipment when not less than 75 percent of it still is on the pier or at the airport. This service is not mandatory. However, since in Puerto Rico we do not have public weighers, our office is cooperating in this respect with the interested parties. We have checked the weight of garlic, tuna fish, and raw material shipments for the manufacturing of brooms. In all these cases our certificates have been used as a base for filing claims against sellers.

As recommended by the National Bureau of Standards, a proposed weights and measures bill is under consideration by the Commonwealth Legislature. This bill is based on the model law, modified according to conditions prevailing in Puerto Rico, and providing for the promulgation of Handbook 44. Provisions have been included to penalize first offenses with administrative fines. With this procedure we expect to reduce cases for court action and to accelerate proceedings. The present statute is considered inadequate, inaccurate in some respects, and obsolete. Present regulations will be repealed and replaced by a series of regulations carefully drawn to remain within the bounds set up by the proposed legislation.

Perhaps it is in relation to equipment and facilities that we have had the greatest need for immediate action. Toward this end, a special appropriation was made for providing at least the minimal requirements with respect to reference, office, and field standards. The Bureau of the Budget has recommended additional funds for the year 1957-58.

We are yet in the early stages of reorganization of our Division of Weights and Measures. During this period, work output has improved considerably. For the last eight months, we have examined and tested more weights, more measures, and more weighing and measuring devices, than the number reported for the previous year. Study of regulations, specifications and tolerances has been stressed. Interest has been aroused for establishing the correct and uniform operation procedures. In short, we could say that the spark of aggressiveness has been kindled in our group. We certainly hope this to be just the beginning.

The present developments and future plans of this program have received a most valuable impetus from the Office of Weights and Measures, of the National Bureau of Standards. We are deeply indebted to its leaders. We look forward optimistically to accomplishing more completely the reorganization program it recommended.

HUNDREDWEIGHT OR BUSHEL AS A TRADING UNIT FOR GRAIN

By WILLIAM A. FAUGHT, *Market Organization and Costs Branch,
Marketing Research Division, A.M.S., U. S. Department of
Agriculture*

Growers, grain handlers, and others have recognized for years that several distinct advantages would result from substituting a uniform weight measure for the bushel in grain trading. It has been pointed out that rice, grain sorghums, dry beans and peas, and many seed crops generally are traded on a hundredweight basis. Also, in several western States, all grains are traded in hundredweight units. However, it has been recognized that substitution of hundredweights for bushels in all grain trade in all areas would require changes and would create problems which the grain industry should consider before deciding finally whether or not the change should be made.

Both the Feed and Forage and the Grain Research and Marketing Advisory Committees recommended that the United States Department of Agriculture study the problems involved in shifting the trading unit for grain from bushel to 100-pound units. They asked that the study consider legal obstacles, institutional changes, and statistical data adjustments required if the change were made. Some of the resolutions of the farm organizations supporting these recommendations stated that such information was necessary if members of the grain and feed trade were to give adequate consideration to the question of shifting the trading unit.

In its study of the problem, representatives of the Department interviewed officers of all major farm organizations and grain trade associations. Elevator operators, banking institutions, insurance brokers, and members and officers of futures exchanges also were contacted. Government agencies provided information directly on the nature of the problems and changes that would confront them in the event the shift were made. Several of the grain trade associations polled their membership on the effect of the proposed shift, and this information was made available to the Department.

The necessary changes and the problems reported by those interviewed can be grouped into the following five categories:

- Mental adjustment.
- Legislative changes.
- Changes in forms and office procedures.
- Revision of historical data.
- Changes in trading practices.

Probably the most important change necessitated by a shift in the trading unit for grain, according to those interviewed, would be the mental adjustment to the new unit. In areas other than the West, the experience of grain producers, elevator operators, merchants, and traders on the exchanges is based upon the bushel unit. Farmers plan operations on the basis of expected production and price relationships expressed in bushel terms. Land values and lease arrangements often are based on bushel yields of grain. Similarly, many feeders have made the necessary mental conversions from bushels to pounds in comparing alternative feedstuffs. Elevator operators think of volume and capacity in terms of bushels, and merchants generally quote price offers on a per-bushel basis. Traders on futures exchanges have developed mental concepts of probable price relation-

ships among different markets, different contracts, or different grains that are based on the bushel. These expected relationships have become a part of the mental process whereby traders are able to make decisions on futures transactions quickly and effectively. Substitution of hundredweight for bushels all along the line would require all of these groups to reorient their thinking to the new unit.

Replies of those interviewed indicated that the problem of making mental adjustments to a new trading unit would be more acute among futures traders, since their operations demand that decisions be made more quickly than are those of other groups. All groups would probably require considerable time to make the necessary mental adjustments; and some traders even expressed the opinion that several years of trading on the basis of the new unit would be required for them to regain the degree of proficiency they now have.

The legislative changes necessary to shift from bushels to hundredweights have not been clearly established. Therefore, the first problem in the legislative field would be to determine specific changes required. In some instances, court tests might be necessary. After the required changes are definitely determined, problems would exist similar to those associated with obtaining any legislative change, State or Federal.

Under Federal laws, the term "bushel" is used in describing procedures or setting forth regulations relating to import duties, marketing quotas, acreage allotments, and price supports. While it might not be necessary to amend this legislation, agencies that administer these programs believe that legislation to clarify the legality of the new trading unit would be desirable.

Several States have legislation requiring that grain be traded in bushel units. In some States, fees or charges for handling and storing grain are established by State law on the basis of the bushel. Also, in some States, the necessary legislative changes would be hindered by the fact that most State legislatures meet only every other year.

Minor changes would be necessary in the forms and procedures used in collecting, handling, and reporting data of individual firms, organizations, or Federal or State agencies. However, those providing information agreed generally, that changing the forms and procedures would be relatively easy. Changes also would be required in the forms used for recording data, such as warehouse receipts, scale tickets, and accounting records. Individual firms, as well as grain exchanges and Government agencies, would be affected to varying degrees by these changes. In some instances, existing forms might be used as they are, or altered at little or no expense. However, it was pointed out that most supplies of forms could be used up if sufficient time were allowed between the announcement of a decision to make the shift and the time the shift was to become effective.

Retraining of personnel might be required. In some instances during the transitional period, work schedules generally would be slowed and errors probably increased until workers become accustomed to the new forms and procedures. Regulations, orders, and instructions relating to the collection and publication of data would need revision in some cases.

Statistical data would need extensive revision, but the reporting firms and agencies involved indicated that it would not be necessary to revise all data before the change. Data used by private firms and

Government agencies in planning current operations, or appearing in current reports, would, of course, need to be revised before the shift was made. However, such revision generally was not expected to create a serious problem, particularly if sufficient time were allowed between announcement of the intention to change the unit and the effective date of the change. Eventually, all historical statistics maintained by the grain exchanges, series published by the U. S. Department of Agriculture, National, State, and county data used in the operation of production-adjustment or price-support programs, and some of the series published by State agencies, would need to be revised back to their beginnings. In most instances, all necessary revisions could be made with existing staffs, but some Government agencies with large volumes of data to be converted said they would need additional personnel and moderate increases in funds during the conversion.

According to grain handlers or merchandisers, some trading practices would have to be changed if the trading unit were changed. Commissions charged for transactions on the exchanges, and charges for handling and storing grain would need to be converted or revised, and new tariff sheets prepared by the organization providing these services. Some firms expressed concern about the possible effect upon customer relations of rates expressed on a hundredweight basis for services performed in trading grains.

Revisions in wording would be required in futures contracts, contracts for spot transactions, and in insurance and financing forms. Those interviewed did not expect any particular problem in making the necessary contractual changes, except those in futures contracts. Assuming acceptance by members of futures exchanges of the proposed change in the trading unit, revision of even the futures contract was not expected to pose a serious problem. A special problem of futures exchanges would be the confusion that would result if trading in both bushel and hundredweight contracts should be necessary for a time after the shift. Since futures contracts become active 11 months in advance of their maturity date, some contracts expressed in bushel terms would be outstanding at the time of the proposed shift. It is expected that the new contractual form in hundredweight units could be used only in trading contracts that would become active after the effective date of the shift. Of course, trading in the bushel contracts would have to continue until the expiration date of these contracts.

Replies of the various groups contacted indicated that they did not expect other revisions or changes to create any serious problems.

A major advantage of shifting the trading unit, according to those interviewed, would be the elimination of conversions from pounds to bushels and a probable reduction of errors in computations. Generally, it was agreed that, in the long run, both individual firms and Government agencies would realize some reduction in accounting or clerical costs.

Another potential advantage would be easier comparisons of prices among grains and, in some instances, among markets. As a result of the shift to a uniform weight unit, growers, feeders, and processors would be able to determine relative values of different grains more quickly and accurately, and their marketing decisions would be simplified.

No disadvantages were expected to persist beyond the period of adjustment to the new unit. The time required for the adjustments would vary among the several trade segments and agencies involved. During this transitional period, some confusion would exist, and there might be additional expense during the retraining of clerical help, revision of forms, and mental adjustment to the new unit. However, most segments of the grain trade felt that the problems, changes, and disadvantages during the transitional period would not be insurmountable.

The groups contacted were not in complete agreement on the timing of the shift in the event it is made. The majority suggested that "wintertime" or January 1 would be the preferred time. It was generally agreed that the intention to make the shift should be announced at least one year before its effective date, and some groups indicated that considerably more than a year would be desirable.

It might be pointed out, in closing, that the decision whether or not to shift the unit of trading for grain should be made by producers, farm organizations, and the trade generally, including millers and feed manufacturers. No major difficulties are anticipated in making the changes required by the shift. Most governmental units, as well as most trade and farm organizations, indicated the change would be a distinct advantage. The resulting disadvantages would largely be clerical and short run. If a program is adopted to obtain an orderly shift to the hundredweight unit, our studies indicate that agencies of the Department may be depended upon to cooperate in facilitating the adjustment.

REMARKS OF S. J. BEYHAN, EXECUTIVE VICE PRESIDENT FOR COOPERATIVE MILLS, BALTIMORE, MARYLAND, REPRESENTING THE AMERICAN FEED MANUFACTURERS ASSOCIATION

During the meeting of the Committee of Purchasing Agents, AFMA, in Chicago, May 1, 1957, Dr. Faught was present and spoke on the subject of trading in grains by weight. Since that meeting, there has been much informal discussion of this topic. Dr. Faught's study has been very well accepted. I think, out of deference to the very great interest you men of the Conference have shown in the trading of grains by the hundredweight, and in deference to your past work in this area under the Conference Committee on Trading by Weight, of which George Johnson of Kentucky has been chairman, we would like to keep you posted as to what we are doing.

The next step, of course, is the matter of timing. We have had a good many suggestions, but they may be reduced to about two general alternatives. The date of grain delivery represents one possibility—and you gentlemen understand that grain-futures contracts become active 11 months before delivery. As each successive contract becomes active, we could trade that contract in hundredweight. Along with that, we could start trading in cash possibly with the wheat harvest of 1958. As each of the crops is harvested, trading then could be in hundredweights. Under this alternative the Government would be looked upon to change its data and its agreements to hundredweight by July 1957.

Under the other alternative, we pretty much hinge everything around July 1, 1958. We start trading in the futures contracts then existing, possibly posting them for the period of a year in both

hundredweight and in bushels. At the same time we would start trading in grain by hundredweight. In that connection, the Government data and agreements would be switched, possibly by the Congressional memorandum or record suggested in Chicago as of July 1, 1958.

At the present time, the American Feed Manufacturers are in the process of trying to collect mass opinion with respect to when this change should be made. That job has not been completed. We certainly will advise you of the final decision, based on the mass opinion of the grain and feed trade. We may tell you that the American Feed Manufacturers Association has resolved to do everything it can through its purchasing agents, directors, and membership, to make this change effective just as soon as possible. The difference of opinion now exists only with respect to the timing. Of course, the producers and consumers are much more inclined to take this thing speedily, as against that segment of the trade that puts most of its work and emphasis on trading grain-futures contracts on the organized exchanges, who tend toward more gradual change.

REPORT OF THE COMMITTEE ON RESOLUTION, PRESENTED BY H. M. TURRELL, CHAIRMAN

APPRECIATION TO HONORABLE WALTER WILLIAMS, UNDER SECRETARY OF COMMERCE

Whereas, the Conference this year and in 1955 and in 1954 has been honored by the presence and our knowledge has been increased by the words of the Under Secretary of Commerce, Honorable Walter Williams; and

Whereas, the success of the Conference is enhanced by the interest of the U. S. Department of Commerce so capably discussed by Mr. Williams: Therefore be it

Resolved, That this 42d National Conference on Weights and Measures record its appreciation and gratitude to Mr. Williams and through him to the U. S. Department of Commerce.

APPRECIATION TO DR. ASTIN AND THE STAFF OF THE NATIONAL BUREAU OF STANDARDS

Whereas, the success of the 42d National Conference on Weights and Measures has been due in large part to the sympathetic leadership of Dr. A. V. Astin, Director of the National Bureau of Standards, to the wholehearted cooperation of the staff of the Bureau, and especially to the thoughtful planning and diligent efforts of Mr. W. S. Bussey, Chief of the Office of Weights and Measures, Mr. M. W. Jensen, Assistant Chief, and other members of the staff of that Office: Therefore be it

Resolved, That this 42d National Conference on Weights and Measures record its sincere appreciation to Dr. Astin and his staff.

APPRECIATION TO CONTRIBUTORS TO PROGRAM

Whereas, the National Conference on Weights and Measures is dependent for its success upon the contributions to the program made by the speakers, those who demonstrate devices, and its committees: Therefore be it

Resolved, That this 42d National Conference on Weights and Measures hereby record its appreciation to all such contributors to its program.

APPRECIATION TO GOVERNMENT OF GREAT BRITAIN AND TO MR. T. G. POPPY

Whereas, the National Conference on Weights and Measures is deeply appreciative of the cooperation of the Government of Great Britain in making it possible for Mr. T. G. Poppy, its Controller of Standards, to participate in the activities of the 42d National Conference on Weights and Measures; and

Whereas, this National Conference has heard with much interest and profit Mr. Poppy's contribution to the formal program of its meeting: Therefore be it

Resolved, That this 42d National Conference on Weights and Measures, hereby express its appreciation to Mr. Poppy and to his Government for this evidence of an active interest in weights and measures administration in the United

States, and record its thanks to Mr. Poppy for the preparation and presentation of his address on The Development of Weights and Measures Control in the United Kingdom.

APPRECIATION TO MR. R. W. MacLEAN

Whereas, the discussion of the Central Program for Weights and Measures Standards in Canada, presented to this National Conference by Mr. R. W. MacLean, Director of the Canadian Standards Division, has contributed to our better understanding of weights and measures administration in our neighbor country to the north: Therefore be it

Resolved, That this 42d National Conference on Weights and Measures record its appreciation for this contribution to the program of its meeting, and express to Mr. MacLean its thanks for his attendance and participation in the activities of the Conference.

APPRECIATION TO COOPERATING OFFICIALS

Whereas, it is recognized that attendance at the meetings of the National Conference on Weights and Measures by weights and measures officers and other persons directly concerned with weights and measures administration in the States, counties, and cities, is made possible in large degree by the interest and cooperation of the governing officials of those jurisdictions; Therefore, be it

Resolved, That this 42d National Conference on Weights and Measures record its gratitude for such interest and cooperation by these governing officials and for this evidence of their support of constructive weights and measures supervision throughout the United States.

APPRECIATION TO MANAGEMENT OF HEADQUARTERS HOTEL

Whereas, the management of the Sheraton-Park Hotel, through its facilities and the courtesies of its staff, has assisted materially in the conduct of this 42d National Conference on Weights and Measures; Therefore, be it

Resolved, That this 42d National Conference express its thanks to the management of said hotel.

APPRECIATION TO ALL NATIONS FLAG COMMITTEE

Resolved, That this 42d National Conference on Weights and Measures record this expression of its thanks and appreciation to the All Nations Flag Committee for the distinctive arrangement of flags that has so appropriately graced the rostrum throughout its meeting.

APPRECIATION TO BUSINESS AND INDUSTRY

Whereas, the representatives of business and industry, by their support of the National Conference contribute to its accomplishments; Therefore, be it

Resolved, That the National Conference recognize the increasing spirit of cooperation that has been demonstrated by business and industry toward those charged with official supervision.

APPRECIATION TO SCALE JOURNAL

Whereas, the National Conference on Weights and Measures recognizes the continuing services of the Scale Journal in reporting upon the activities of weights and measures officials and the proceedings of their formal meetings; Therefore, be it

Resolved, That this 42d National Conference on Weights and Measures record its appreciation for such services.

THE ADOPTION OF THE HUNDREDWEIGHT AS THE BASIC UNIT FOR TRADING IN GRAINS

Whereas, the National Conference on Weights and Measures for many years has urged the abandonment of the bushel as the basic unit for trading in grains and the substitution therefor of the hundredweight of 100 avoirdupois pounds; and

Whereas, the U. S. Department of Agriculture, through its representative, Dr. William A. Faught, has presented to this Conference a report on a comprehensive study of the matter, which study demonstrates the preponderance of advantages for adopting the hundredweight and abandoning the bushel; Therefore, be it

Resolved, That this 42d National Conference on Weights and Measures reiterate its conviction that the best interests of all parties concerned will be served if grains are bought and sold strictly on a weight basis; and be it further

Resolved, That this Conference strongly urge that the U. S. Department of Agriculture, the several State Departments of Agriculture, and interested industry and business individually and collectively move with definite plans toward the official adoption of the hundredweight as the basic unit for trading in grains.

(The report of the Resolutions Committee was adopted by the Conference.)

REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS PRESENTED BY G. H. LEITHAUSER, CHAIRMAN, AND DISCUSSION THEREON

The Committee on Laws and Regulations, in submitting its Tentative Report to the 42d National Conference on Weights and Measures, re-emphasized that uniform laws, uniform interpretations, and uniform inspection procedures are both desirable and essential for sound and efficient weights and measures enforcement. These can be accomplished only through broad cooperation among all persons concerned, including officials, representatives of industry, and the public. The Committee believes that such cooperation is improving, and hopes that it will continue to improve and even more rapidly.

The Committee, having previously submitted a tentative report and having held open hearings on Monday, June 3, on items included therein, now submits for the consideration and action of this National Conference its final report.

[Secretary's Note: As each individual recommendation or item was presented, it was moved and seconded that it be adopted. Such motions prevailed in all cases except where otherwise noted.]

Packing House Products—Marking Requirements

As a result of the Committee's recommendation and Conference action during the 41st National Conference on Weights and Measures, a special subcommittee of this Committee was appointed to study the labeling of packing-house products. This special subcommittee was composed of the following:

George H. Leithauser, Chairman, Chief Inspector, Division of Weights and Measures, City of Baltimore, Maryland.

Nalls Berryman, Director, Weights and Measures Division, State of Florida.

Frank M. Greene, Chief, Division of Weights and Measures, State of Connecticut.

Chester Adams, American Meat Institute, Chicago, Illinois.

William G. Andrews, Grand Union Company, East Paterson, New Jersey.

Herbert Rumsey, Jr., Tobin Packing Co., Inc., Rochester, New York. (Representing the Western States Meat Packers Assn., Inc., Independent Meat Packers Assn., and Eastern States Meat Packers Assn.)

Mrs. Stephen J. Nicholas, General Federation of Women's Clubs.

W. T. Harris, Charlotte, North Carolina. (Representing the National Association of Retail Grocers.)

Dr. J. R. Scott, Chief, Trade Label Section, Meat Inspection Branch, Agricultural Research Service, U. S. Dept. of Agriculture, Washington, D. C.

Sumner C. Rowe, Chemist, Food Division, Food and Drug Administration, U. S. Dept. of Health, Education, and Welfare, Washington, D. C.

The subcommittee met at the National Bureau of Standards, Washington, D. C., February 7, 1957. All members of the subcommittee, except Mrs. S. J. Nicholas and Mr. H. Rumsey, Jr., were present. Mr. Rumsey was represented by Mr. F. H. Firor, Merkel, Inc., Jamaica, New York. At the conclusion of a full day's discussion, it was the consensus of the subcommittee that further studies should be made before any definite recommendations were agreed upon. Mr.

H. F. Firor, proxy for Mr. Rumsey, assumed the responsibility of making these further studies.

Prior to the open meetings of the Committee on Laws and Regulations that were held preceding this 42d National Conference, the Committee received from Mr. Herbert Rumsey, Jr., the following letter:

TOBIN PACKING CO., INC.

Rochester 2, N. Y.

May 6, 1957

Mr. George H. Leithauser, Chairman
Committee on Laws & Regulations

Dear Mr. Leithauser:

This communication is in reference to your correspondence directed to Mr. Firor, April 17th, and my reply for him, April 22nd, relative to our Committee's additional study relating to proposed revision in labeling of certain packing house products.

Our Committee met last Friday, May 3d, and further reviewed the facts involved as were presented by Mr. Firor at your Washington Meeting February 7th this year. Our further study reveals that the recent availability of vast varieties of new kinds of transparent packaging materials of the type that eliminate or minimize the degree of natural shrink of the product packaged, may greatly change the status of the natural product shrinkage as was present when we first introduced this subject.

In view of these new developments, we feel that it would not be timely to present the result of our study as was contemplated at your conference meeting scheduled for June the 3d. We feel that under the circumstances, it would be wisdom to conduct further study and experimenting with these new films to more thoroughly evaluate their respective qualifications regarding the possible elimination of normal shrinkage of the product packaged.

We appreciate the consideration you and your associates have given to our problem and are sorry that we cannot present finalized data at this time.

Cordially yours,

/s/ H. Rumsey, Jr.

As a result of this communication, the Committee now recommends that no action on this item be taken at this time.

The Committee submits the following items for consideration and action by this Conference:

1. Poultry—Cooked.

The Committee interprets Section 24 of the Model State Law on Weights and Measures as prohibiting the sale of "cooked" poultry by the "piece." Thus, the Committee recommends that, in those jurisdictions where Section 24 of the Model Law has been adopted, any such practices be prohibited, and that in all other jurisdictions such practices be discouraged.

2. Poultry—Stuffed.

The 40th National Conference on Weights and Measures, in 1955, took action with respect to the sale of "Frozen Stuffed Turkeys." In conformance with that action, the Committee recommends that, when any poultry, cooked or uncooked, is stuffed with dressing, it should be clearly marked with the net weight of the poultry and with the net weight of any stuffing.

3. Waxed Paper in Rolls.

The Committee recommends that waxed paper in rolls be labeled as to the width and length of the paper in the roll, in terms of feet and/or inches.

4. Halibut Fletches—Fresh Frozen.

The Committee received a report from one jurisdiction that large quantities of "fresh frozen halibut fletches" were found to be short weight. Investigation

revealed that this product was glazed by being quick frozen in such a manner as to cause a layer of ice to be frozen on each fletch. In turn, the weight of the ice was included in the net weight of the fish. This practice is contrary to the provisions of the Model Law and the Model Package Marking Regulation adopted by the National Conference. While this is unquestionably an enforcement problem that requires no further action on the part of the Conference, the Committee does wish to call the matter to the attention of all weights and measures officials and distributors of fish products, in order that the practice can be corrected.

5. *Soap—Bars.*

The Committee has had correspondence with at least two jurisdictions during the year relative to the marking of bars of soap in terms of net weight. The National Conference has given much consideration to this subject, and after very careful study the Committee recommended and the 37th National Conference adopted the following:

Soap (Bars and Cakes).—Should be sold by numerical count and the number of bars or cakes in a package should be stated on the outside of the package in a plain and conspicuous manner, provided, however, that where a package contains only 1 bar or cake of soap such declaration or statement should not be required; and provided, further, that these stipulations shall not apply to medicated soaps required to be marked by weight under the Federal Food, Drug, and Cosmetic Act.

The consensus of the Committee has remained unchanged since the above report was submitted and approved. Therefore, no further recommendation is offered at this time.

6. *Rope and Cordage Products.*

This Committee and the National Conference have considered and acted upon this subject repeatedly. The strong opinion of weights and measures officials has been and continues to be that these products should be sold by "net weight" the same as all others. Manufacturers of these items continue to insist on selling by "gross weight." They continue to "lobby through" amendments to weights and measures laws to exempt these products from the usual requirements of "sale by net weight." The Committee recommends that this Conference express its opposition to this practice and urges all weights and measures officials to enforce their "sale by net weight" laws with regard to rope and cordage products. To those jurisdictions where exemptions have been written into the law, the Committee recommends that efforts be made to repeal such exemptions.

7. *Fruits and Vegetables in Paper Cartons.*

Fruits and vegetables packed in paper cartons for the purpose of sale shall be construed to be in package form, and the net quantity of the contents shall be plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count.

The term "for the purpose of sale" is used so that carry-all bags, tote bags, or other containers that are merely used for transportation of the commodity are eliminated from marking requirements.

(After brief discussion, a motion was made by Mr. Christie to amend Item No. 7 by striking out the second paragraph. The motion carried and Item No. 7, as amended, and as shown below, was adopted by the Conference.)

7. *Fruits and Vegetables in Paper Cartons*

Fruits and vegetables packed in paper cartons for the purpose of sale shall be construed to be in package form, and the net quantity of the contents shall be plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count.

8. *Pulp Wood.*

Pulp wood may be sold by weight or measure.

The term Pulp Wood shall be construed to mean any and all wood, regardless of size or shape, which can be, or may be, manufactured into pulp, and which was cut originally for such purpose.

The time limit for weighing such pulp wood, when sold on a weight basis, is left up to the various jurisdictions to decide.

9. *Wallpaper.*

Wallpaper should be marked as to the length and width of each roll, in terms of linear measure.

MR. R. E. MEEK: Mr. Chairman, I wonder why the word "should" was used instead of "shall"?

MR. LARIO: At the committee meeting I believe it was suggested that the words "wall coverings" should also be included.

MR. LEITHUSER: That is correct.

MR. GREENE: I move that Item No. 9 be amended to read as follows:

9. *Wall Paper and Wall Coverings*

Wallpaper and wall coverings shall be marked as to the length and width of each roll, in terms of linear measure.

(The motion carried and Item No. 9, as amended, was adopted by the Conference.)

10. *Fertilizer for Lawns (Inert Liquid Fertilizer).*

Because the Committee has not yet been able to develop sufficient information to offer a sound recommendation with respect to the sale of this commodity, the Committee requests the authority to hold this item for further study.

(The report of the Committee on Laws and Regulations, as amended, was adopted by the Conference.)

BREAKFAST MEETING OF THE INCOMING EXECUTIVE COMMITTEE OF THE CONFERENCE, FRIDAY, JUNE 7, 1957

On Friday morning, June 7, the newly elected Executive Committee, with the chairmen of the standing committees and the weights and measures members on the Advisory Committee as guests, met to discuss and reach decisions regarding the 43d Conference. Present at the meeting were eight of the nine officers, seven of the ten Executive Committee members, the chairmen of the three standing committees, the two weights and measures representatives on the Advisory Committee, and the retiring treasurer. The meeting was presided over by the newly elected Conference Chairman, J. P. McBride. The following decisions were reached regarding the 43d National Conference on Weights and Measures, 1958:

1. *Place:* Sheraton-Park Hotel, Washington, D. C.
2. *Date:* June 9-13, 1958.
3. *Duration:* Open committee meetings on Monday, opening session Tuesday morning, Wednesday afternoon free of any scheduled meeting, the remainder of the week scheduled according to the needs of the program.
4. *Program:* To continue some foreign participation, if practicable, and schedule more discussion-type topics. All Conference delegates are urgently requested to send in program suggestions for 1958 NOW.
5. *Distribution of papers:* The committee voted to continue the system of distribution of Conference papers through a checklist arrangement.
6. *Social activities:* Similar to previous years, with the Conference party to be held on *Tuesday night*.
7. *Ladies' entertainment:* To be arranged by the Secretary after consultation with a Ladies' Committee.
8. The registration will remain at \$5.
9. The retiring Conference Chaplain, Rev. R. W. Searles, noted that, although he was directed by the previous Executive Committee to send appropriate cards for the Conference to members during sickness or at death, he has not been receiving information in time to carry out the wishes of the committee. All delegates to the National Conference are urged to inform the present Chaplain of sicknesses and deaths at the following address: Mr. J. H. Meek, Direction, Division of Markets, 1200 East Main Street, Richmond 19, Virginia.
10. The committee received a letter from the Ladies' Committee expressing appreciation to the Conference for its hospitality. The letter was read to the Conference during the Friday morning session.

SIXTH SESSION—MORNING OF FRIDAY, JUNE 7, 1957

(J. E. MAHONEY, VICE PRESIDENT, PRESIDING)

REMARKS OF A. T. MCPHERSON, ASSOCIATE DIRECTOR, NATIONAL BUREAU OF STANDARDS

The 1957 Conference marks a very important period in the history of the National Conference on Weights and Measures. Almost from the beginning in 1905 the Conference repeatedly tried, without success, to formalize its organization and procedure. This long-sought objective was accomplished earlier this week by the unanimous adoption of the report of the committee headed by Mr. Meek of Indiana.

This statement of Organization and Procedure emphasizes the role of the Bureau in providing the scientific and technical knowledge needed as a basis for the laws, regulations, codes, specifications, and tolerances with which you are concerned. We of the Bureau are here to back you up—call on us whenever we can be of assistance.

OPEN FORUM—ADMINISTRATIVE PROBLEMS

(W. A. KERLIN, Sealer of Weights and Measures, Alameda County, California, served as Moderator during the open forum.)

MR. KERLIN: The subject of the open forum this morning is Administrative Problems. A select group of men have been chosen to discuss briefly some of the various problems that are encountered by weights and measures officials in the planning and management of their programs.

RELATIONS BETWEEN STATE AND LOCAL DEPARTMENTS

By JAMES J. POWERS, *Supervisor, Bureau of Weights and Measures, Philadelphia, Pennsylvania*

All the works of nature are linked one to the other and form a whole, in the immensity of which we only perceive some fine points that appear to be detached because those who unite them are concealed from us. The result of this connection is that no work phase of our activities should be neglected, none that may provide some direct or indirect utility to man. That which appears futile should be grasped like the others. In offering ourselves, we should be assured that we have hold of a chain, the precious links of which will be discovered by time. If those links that are wanting leave vacancies, the intermediate links are presented to us every day by the hand of chance, and it is our business to arrange them.

We see people sit in security of their homes during thunderstorms. This would not have been possible had not Franklin supplied the link of the lightning rod as a conductor in the chain of safety.

When forging a chain, each link is manufactured separately, then joined together, to make the chain of the required strength to meet

the required needs. Man is a dependent being. He cannot live of himself alone. On the contrary, we are all dependent on one another. "As you sow, so shall you reap." Your influence has its limitations. Have you ever cast a stone on a body of water and watched the ripples spread from the point of contact of the stone with the water? They spread in a circular form and gradually disappear. So, too, with our contacts—large at point of contact, then gradually fade into oblivion. In this great chain of weights and measures enforcement, which spreads across this great country of ours—yea it even spreads beyond our borders—we, too, have our weak or missing links in this chain, or even links that are wanting. We, too, are dependent on one another for cooperation, help, and support.

Have you ever traveled down a winding river in a canoe and tried to visualize what lies beyond the bend, whether the course be smooth or filled with rapids? You are in a state of confusion or suspense until you have turned the bend. Fortunately there are those on higher ground who have the clear vision of the surroundings and can make a survey of what is ahead, just as in the army with its observation units. Let us liken ourselves to all the foregoing facts. By doing so, we can better evaluate the problems of good genuine relationship between State, county, and city departments of weights and measures.

I believe in all States the setup is, to all intents and purposes, the same—State, county, and city, and local governments.

Primarily, we all look to our National Bureau of Standards, then State, county, and local groups. You cannot move in two directions. You move forward or backward, and I do not subscribe to the theory that any of our groups are thinking of anything but forward for progress. Only by strict adherence to cooperation, with the fountain-head of our activities to the lowest echelon, can we expect to have this progress.

Those at the head are on the high ground and see what is beyond the river's bend. They can supply the missing link. They can cause more ripples on the body of water to carry the ripples to the farthest ends on the shores. As dependent beings, we must look to them for guidance.

Fortunately, through the great Commonwealth of Pennsylvania, we have that cooperation, and I speak as one who has enjoyed and appreciated it from the State and city level.

In Pennsylvania we have our weights and measures association where we meet annually to reconcile any problems. We also conduct a school of instruction, have an executive committee and a legislative committee to promote, propose, and lobby for laws beneficial to the cause for which we are dedicated. We are most fortunate in having as the guiding force Miss Genevieve Blatt, an able lawyer, as Secretary of Internal Affairs for the Commonwealth of Pennsylvania, whose interest, wise counsel, and cooperation have been most helpful.

Where there are problems that cross county or State lines, complete harmony and cooperation have been outstanding. This is the type of understanding, cooperation, and loyalty upon which our great country was founded, exists, and, please God, will endure. No political barriers should be expected to disturb harmonious relations between enforcement officers whose first duty is to protect the buying public. Personal differences and opinion should be submerged, and our motto

always "onward and upward for cooperation, vigilance, and loyalty to the tasks to which we have dedicated ourselves." May God guide and sustain us in our endeavors.

**RELATIONS BETWEEN THE OFFICIAL AND THE MANUFACTURERS AND DEALERS IN
WEIGHING AND MEASURING DEVICES**

By C. O. COTTON, *Supervising Inspector of Weights and Measures, Department of Agriculture, State of Michigan*

The subject assigned to me in this open forum rightfully should be included in a discussion of the problems involved in the administration of a weights and measures program, and merits careful consideration by every weights and measures official. Proper relations between the official and the manufacturers of and the dealers in weighing and measuring devices will add to and strengthen the weights and measures program, while improper relations can only detract from the effort and, thus, materially weaken the entire program.

The weights and measures official, in order to be successful in his work, must command a special kind of respect from the people with whom he comes in contact in the enforcement of the weights and measures laws. He must obtain and keep a reputation of fairness and impartiality in all of his official dealings. Not only is the official an enforcement officer, but, due to the nature of his work, he also is a public arbiter in those commercial transactions involving the transfer of commodities by weight or measure. Any situation that tends to damage that feeling of respect for the official will lessen his effectiveness.

The identity of a weights and measures official is provided for by law. His duties and responsibilities are described, at least in general terms, and, for the most part, his function is to protect the people in his jurisdiction from receiving less than what they pay for.

Important to the over-all program is the testing and control of the various commercial weighing and measuring devices in use in the jurisdiction. Because of this activity, the official, of necessity, comes in close contact with representatives of the industries involved in the manufacturing, selling, and repairing of weighing and measuring equipment. Cooperation on a business-like basis between the official and the industry is of mutual benefit to all parties, providing the relations between them are kept in proper accord.

From the official's standpoint, he must maintain an attitude of dignified friendliness, never bordering on intimacy. He must be careful that all representatives are treated with the same accord and that no partiality is shown to any one party. Frequently, the official is called upon to recommend a supplier or repairman. He should never recommend only one. Our staff is instructed to recommend at least three reputable concerns, any one of which would be satisfactory to the inquirer. Along the same line, the official should be very careful not to discuss the merits or shortcomings of a particular company's product. Discussion of types of devices to fit a certain situation is always proper, but, never should the official discuss the possibilities of one brand in favor of another.

The acceptance of gifts of material things or any form of gratuity by the official is inexcusable and certainly provides the means for a complete breakdown of his entire program. Even though, at the time of the offering of the gratuity, no special favor is contemplated by

the giver, any attempt of the official to maintain his impartiality in case of a decision at a later date would be very difficult. In fact it is very possible, if a decision was to be made against a product of the donor, the official would be reminded of the favor and a returning favor might be asked for.

It is here that mention should be made of the responsibility that the representatives of the manufacturer have in protecting the integrity of the weights and measures official and his program. It is easily understood that the result of an active weights and measures program materially benefits those people involved in making and selling weighing and measuring devices; therefore, to enhance the effectiveness of the official's program will naturally increase the results of the supplier's efforts.

The agents of the manufacturing industry should refrain from asking for special favors or considerations from the official. The industry representative should only ask for, and in this he should insist, that the weights and measures official treat him and his competitor on an equal basis. He should refrain from originating any situation that might reflect on the reputation of the official.

In one instance, in our State, a salesman of one of the supplier companies was "following up" on the route of one of our inspectors, soliciting new business, and contracting for the repair of condemned devices. Immediately a complaint was sent to our office intimating the inspector and the salesman were working together. We could easily establish, in our own minds, that the inspector was not conscious of the salesman's procedure. The net results of this venture were: A complaint to his company was made by the Merchant's Association in the city; even though the salesman was dismissed, the company naturally suffered a loss in their reputation, and to some degree, the effectiveness of the inspector in that area was reduced.

The following items summarize:

1. The integrity of the weights and measures official determines, to a large extent, the effectiveness of his program.
2. The weights and measures official should maintain his identity at all times in his official dealings.
3. In his contact with representatives of the manufacturers of, and dealers in, weighing and measuring equipment, the official should maintain an attitude of dignified friendliness, never bordering on intimacy.
4. Gratuities should never be accepted by the weights and measures official.
5. The representatives of supplier industries have a responsibility to protect the integrity of the weights and measures official and his program.

MR. KERLIN: I would like to elaborate on one of Mr. Cotton's statements which was very important. He stressed the point of gratuities. During the past year in California our State Association sponsored a Bill in the Legislature that would prohibit weights and measures officials in any capacity from receiving any gratuity or the like for any inspection or anything that is a part of their official responsibility. Believe me, we had no trouble getting that Bill through the Legislature.

I would also like to ask Mr. Cotton one question. Do you have any requirement that a company notify you of where and when they sell or install a weighing or measuring device?

MR. COTTON: At the present time, our law provides that an unsealed weighing or measuring device is illegal in the State. We do not have any provision that requires the installing company or agency to notify us. The responsibility is left up to the user of the device.

ENFORCEMENT OF PACKAGE MARKING REQUIREMENTS

By GEORGE L. JOHNSON, *Director, Division of Weights and Measures, Department of Agriculture, State of Kentucky*

The subject of "Enforcement of Package Marking Requirements" will be presented in this paper as "viewed" by an enforcement official who is charged with the duty of quantity enforcement alone. Therefore, the actual theme will be enforcement of quantity marking requirements for packages.

Industry, in order to meet the public demand for quicker service, neater purchases, and opportunities to select items that are appealing, has gone to packaging commodities in advance of sale. With increased public demand, this method of trading is becoming more common every day. More and more items are being offered for sale in package form. Therefore, it is necessary that full descriptions be given each item packaged to inform the purchaser of the contents. Included in this information are quantity declarations. In order that these quantity statements not be misleading, laws are enacted to protect the honest merchant and the purchasers. It is well known by weights and measures officials that these laws are enforced by both Federal and State agencies. The Federal laws cover mostly interstate shipments, whereas States enforce laws governing commerce within their own boundaries.

The basic problem with respect to the State laws covering package labeling is uniformity. Much time is required to bring about uniform laws and regulations among 48 States and the District of Columbia; however, much progress is being made along this line as a result of the work being done through the National Conference on Weights and Measures.

Every weights and measures official who administers laws setting up package marking requirements has a definite responsibility to the people whom he serves and should work with diligence in proving the quantity statements on all package commodities being sold in his jurisdiction. This is never-ending work, because weights and measures inspectors never will be able to check every commodity offered for sale. Nevertheless, there must be more and more active enforcement and more uniformity among the laws and regulations of the States.

Fortunately, basic recommendations have been made dealing with proper procedures for checkweighing commodities. It is admittedly very difficult to obtain uniform testing procedures among 48 States; however, greater uniformity of enforcement procedures will result in fewer condemnations of packaged commodities.

Efforts should be made in all States to do as much checkweighing as possible at the packing plants and large wholesale outlets. Of course, in self-service stores where packaging in advance of sale is done, the inspection must be made at the retail level. In the package-checking procedure, average weights should be determined and these averages be compared with the represented net weights on packages.

Excessive errors should be noted and prohibited. When checkweighing packaged commodities, it is usually impossible to check every package; therefore, it is recommended that a percentage of the stock be examined and that action on the lot be based on results of the sample. This method has been upheld by court opinions.

When a commodity is found to be short or below the represented net weight, a stop-sale order should be issued. This plan is reasonable

and should be basic. Nonetheless, weights and measures officials must constantly bear in mind the individual problems of the packers, wholesalers, and retailers, and in some cases strict enforcement must be tempered. It is very important to follow back with periodic rechecks. The weights and measures official must satisfy himself that all necessary steps are taken by the packer to provide accurate net weights.

Weights and measures inspectors number so few when compared with the tremendous number and the vast variety of packages, that attention must be given to the education of the consumers. This can be done in many ways—for example, through newspapers, radio, and television. In addition, the retail merchants must be taught to be weights and measures conscious. With their obvious interest in accurate weights, the merchants can act as unofficial inspectors checkweighing their deliveries and advising the enforcement officials of irregularities in packages received by them from their suppliers.

Most State laws have sections requiring that all packaged commodities be labeled as to net weight, liquid measure, dry measure, or numerical count. This requirement should be enforced with the same firmness as the accurate net-weight requirement. Packages should be condemned when they are improperly labeled.

I have attempted to set out the basic principles of enforcement of package-marking requirements, to describe some of the problems and conditions, and to suggest certain recommendations that may assist the weights and measures inspector in carrying out his package-marking laws.

(There was considerable discussion on the subject of quantity-marking requirements for packaged commodities. Particular attention was given to State and Federal requirements regarding marking of packages that are shipped in interstate commerce.)

EXCHANGE OF INFORMATION WITH OTHER WEIGHTS AND MEASURES OFFICIALS

By E. L. RANDALL, *State Sealer, Department of Weights and Measures, State of Nevada*

It is my privilege to present a brief paper on the subject "Exchange of Information with Other Weights and Measures Officials." I believe we can all agree that one of the avowed purposes of this organization is that we work together. Certainly we cannot do this unless we know what the other fellow is doing. This has been recognized on many occasions, and some efforts to accomplish it have met with considerable success in certain areas. It would seem, now, that all we need do is to expand such areas until the program is nationwide.

A review of these successful efforts indicates that an official bulletin by a sealer or a group of sealers plays the dominant role. These publications have one aim in common: To give to the sealers all the information possible regarding their work. This in turn serves a dual purpose: (1) to let the other sealers know what is being done, and (2) how it is being done, and by whom. The early publications in New York and Michigan served as "melting pots" of ideas and proved to be of inestimable value in their respective areas.

Later on, other publications appeared in the form of newsletters or bulletins from Indiana, Ohio, Texas, California, and the Southern Association. Our Committee on Education stated, in a report to the Conference in 1947, that these publications "issued by the various

departments and sealer organizations help a lot to keep weights and measures officials throughout the country better informed and to keep their work more uniform and in closer harmony." After all, this just expresses the chief objective of our National Conference—to promote and achieve uniformity in laws and regulations and in the interpretation and enforcement thereof. Your Committee on Education has consistently expounded this principle, and in 1950 suggested that a program be designed to produce the following objectives: (1) Better understanding of problems encountered in various areas; (2) uniformity of enforcement; (3) increased efficiency in operations; and (4) uniformity in approval and rejection of commercial equipment. Much has been said and much has been done to achieve these objectives. However, the surface is only scratched. There has been enough said, but there is still much to be done. We know what is needed and what we want, but how are we going to get it?

Unfortunately, your speaker is unable to come up with an answer or a complete solution, but, since I have the floor, it is incumbent upon me at least to present my ideas for you to consider, and to invite you to present your ideas.

It would seem to me that we should start with a program of proven success and expand it to cover the desired area—to fit the needs of the entire Conference. This is simply stated, but its execution is fraught with many problems, the solutions to which could be resolved by men with experience in our organization.

The execution would require either the formation of a new committee, or an additional authorization to the Committee on Education. I believe a separate committee should be named. This committee should have a secretary of somewhat permanent status, preferably located close to Washington. This committee secretary should handle all correspondence between the committee and the weights and measures officials. He should act as a constant liaison between his committee and the Secretary of the National Conference. The committee, in turn, should:

(1) Be composed of representatives of the various sections established over the country and such others as deemed advisable by the Conference.
(2) Act as a clearing house on information.
(3) Give such information as it can upon request.

(4) Suggest the problems that should be presented to the National Conference Meetings.

(5) Have knowledge of all the State laws as well as the Model Law and regulations established by the National Conference.

(6) Have a knowledge of administrative setups existing throughout the country. (Much of this information could probably be obtained from a recent survey made by a consumers research organization.)

(7) Receive copies of all current weights and measures bulletins and such other information as will aid it to carry out its purpose.

(8) Issue a monthly publication to be sent to all officials who subscribe to it.

Of all these functions, the bulletin is the most important. Most officials have budget money for publications, and perhaps this would pay for the cost of printing and mailing. Such a publication could carry advertisements, if necessary, to support it. Through this medium, then, weights and measures officials could keep abreast of activities all over the country. They would see pictures of different types of equipment used by the various States. There is a wealth of information to be funneled through a central source.

We should not overlook the fact that weights and measures officials are not responsible for all the confusion which arises from a lack of uniformity of laws affecting weights and measures. Some of these laws, particularly on bread weights, are statutes over which we have or have had little or no control. Perhaps this committee could be of assistance in this direction—warning State regulatory officials and affected industries of proposed policies or laws that are not in conformity with existing laws or industrial practices. I am sure the value of this service is evident, if it could be effectuated.

The success of this venture would depend entirely, of course, on the quality and sincerity of the members of the committee and the co-operation they received from the sealers all over the country. As far as the membership is concerned, its quality would be insured if it were carefully selected. Certainly a sectional organization of weights and measures officials would choose an active and qualified member to represent it. The group could select its own chairman and secretary. Those are details that could be worked out in such a manner as to insure an active and conscientious committee.

Again, I want to assure you that these suggestions are being presented for the express purpose of provoking thought and discussion. Certainly some of these thoughts have been in the minds of many of you since 1928 or earlier. Surely there are those among you who are qualified to outline and guide a course of action. Let us act on such knowledge. Let us act on the assumption that there will always be officials located all over the country who need this kind of help and who always will be looking for it, oftentimes in vain. Let us act now.

I might point out that, being a relatively new face at these Conferences, I was not quite sure how the above ideas would be received, so I have tried them out, so to speak, on several sealers in the western States. They responded quite favorably and are in complete accord that action should be taken along the suggested lines. Therefore, let me say, *we* present them now for your consideration.

Mr. JACKSON: Mr. Randall, could you give some further specific recommendations on how you feel this exchange of information program on a nationwide scale could be put into operation before the next Conference? What can be done specifically to get this program started during the ensuing year?

Mr. RANDALL: I would recommend that during our regular business meeting a motion be made to set up a committee and start to operate. I think that the work that I have done in getting this report up and the work J. T. Kennedy did in 1950 and 1951 will have been in vain if we do not take some such action.

JUSTIFICATION FOR BUDGET INCREASES

By ROBERT WILLIAMS, *County Sealer of Weights and Measures, Nassau County, New York*

In considering budget justification, it might be well first to analyze the expenses involved in a weights and measures activity.

Usually the first item on the budget is the listing of salaries. It seems logical to me that the sealer, to justify any request for an increase in salary, either for himself or any of the personnel in his department, must be doing a full time job to the best of his ability. If

he has assistants, deputies, or inspectors, naturally he should have good executive ability, know what his men are doing, and how they should do it.

In factories, offices, or other places of business where men are employed in responsible positions, the employee is not usually elevated in position and given salary increases if he is careless, lazy, or disinterested in his work. Generally, salary increases are earned by faithful, consistent, and conscientious work.

I believe that our City Councils, our Boards of Supervisors, or other appointing officials know more about what their weights and measures officials are doing than we think they know. Many sealers are doing a good job while some others only *talk* a good job. There is a difference. If the sealer has inspectors working under his direction, he should be just as concerned about getting proper salary adjustments for his men as he is about his own salary increase.

In considering equipment needs, there must be program planning for a year or two ahead. Existing equipment must be examined carefully to determine if it is sufficient to carry on the program. Preparatory to presenting a budget, the sealer should take stock of his equipment, and note any items of equipment that he needs, whether additional or replacement. The approximate cost of each item should then be ascertained. Actual needs, not inflated amounts, should be requested. The department head should be honest with the Budget Officer or Committee. They will respect honesty.

Existing equipment should be kept accurate and in good repair. There should be no hesitancy in asking for budgetary appropriations to replace or repair equipment that might lower the respect of the public for the work the sealer is doing.

My experience is that budgetary requests are granted if the sealer is doing a job to the best of his ability, with the help that he has, providing, of course, that at the budget hearing he is able to clearly and sincerely state his equipment and personnel needs. Logical justification and support of these requests must be ready and forthcoming if asked for.

A description of budget experiences in my jurisdiction, Nassau County, New York, might be interesting. Three years ago we had two assistant sealers, three senior inspectors, and seven inspectors, a secretary, and a typist clerk. The inspectors started at a salary of \$3,408 per annum, with six annual increments of \$138 each, to a top salary of \$4,236. The senior inspectors were in a salary range from \$3,610 to \$4,576. I asked for salary increases for the two assistant sealers, the three senior inspectors, and the secretary. These requests were all granted. This, of course, made the inspectors unhappy. They felt that, as they were in the lowest paid group, they should have been the first to be given an increase. At first thought this might seem reasonable, but if the inspectors were to be upgraded, the senior inspectors first had to be advanced. The following year promotions were granted to the inspectors. I felt that, if I asked for a change of grade and an increase for everyone in the department at the same time, it would have been quite probable that nobody would have gotten an increase.

While we are speaking of salaries, I might say that in 32 years I have never asked for a salary increase for myself. By my asking for and getting salary increases for the assistant sealers and senior

inspectors, the authorities have always taken care that my salary was kept far enough in advance of my assistants that I was in no danger of being overtaken salarywise.

It is advisable to make an appointment with the Comptroller or some other official who is on the Budget Committee. This meeting should take place several weeks in advance of the budget hearing and should include discussions of the plans and program for the year ahead. The weights and measures official should relate the amount of money being requested, and why. He should explain what can be done with the additional help or equipment and its value both to the honest merchants and to the purchasing public. A meeting of this kind will do two things. It will give the budget official an insight on weights and measures activities that he may never have known of or thought of; it will prepare him to support the budget request.

I believe that the successful and progressive weights and measures official will list in his budget request the equipment and other additions that he needs, has use for, and is prepared to use in his future well-planned program, when he appears before the Budget Committee; that he will give his reasons and justifications for the budgetary request by outlining what he proposes to do with the items included, and by stating the value of the services he can render to the public and to the merchants through use of the additional facilities.

Expanding activities or increased personnel is certainly justification for budget increase for the purchase of equipment and for office expenses. Be certain that the quality of work performed by your department justifies your every request. There is nothing so important as the continued and consistent high-quality performance of a department.

There are no substitutes for excellent work the year around, careful preparation of the budget requests, and honest and sincere budget justifications. It should be understood that expanding commerce and new methods of doing business bring about greater responsibility to the weights and measures official. These responsibilities must be met with efficiency, staff, and equipment.

In 1928, the budget for the Nassau County Weights and Measures Department was \$13,590. We had 1 sealer and 2 deputy sealers and a girl in the office. The population of the County was about 300,000. Our budget for 1957 is \$111,580. We have a sealer, 2 assistant sealers, 2 senior inspectors, 13 inspectors, a secretary, and a typist clerk. Today, the population of our County is over 1,300,000, and we are not lacking in equipment. We believe we are doing a good job and we are always seeking to improve and expand our services.

MR. BAUCOM: I should like to add one thing to what Mr. Williams said which I find helpful. Get quotations on prices of equipment which you think you want from two or three concerns, so that you may use these in justifying budget requests by presenting facts and not estimates.

MR. CHRISTIE: Since we have a county that is progressing in practically the same manner that your county has and since this county has set up a 6-year planning program, do you think that this is too long or too short a period in which to plan the weights and measures program, considering the rapid growth of the community?

MR. WILLIAMS: That depends on whether or not you are starting from scratch. Assuming that you are not, I do not think that planning that far ahead is inappropriate.

MR. KERLIN: Do you prepare any workload statistics to substantiate requests for increases in personnel? For example, when we want to have any increases to our staff, we have to present workload statistics that a man can do so many scales and pumps within a certain period. We have to show the increase in the number of weighing and measuring devices that were in the county over the past few years and when this primary figure is increased to such a point, then just automatically we will get another man. Frankly, I will agree that to work out some of these workload statistics can be a difficult task for the weights and measures official.

MR. WILLIAMS: I believe it would be extremely difficult to pinpoint our workload statistically. In one instance, you might inspect and test a scale in the period of 5 minutes, where the same type of scale that you inspect next might take 20 minutes.

We have not been using workload statistics, but the officials in our county recognize the fact that the tremendous increase in population certainly bears out our justifications for increases. Each department is growing in leaps and bounds, and certainly to stand still would indicate that we were doing very little. Consequently, we are more or less encouraged to keep in step with this expansion.

MR. JACKSON: I think the problem of preparing workload statistics is very difficult, but I think from what little experience we have had, if budget people ask for them we had better prepare them. To cite an example, we had one of our accountants figure and prepare a chart showing frequency of inspection based on budgetary levels. This was something that the State budget analyst understood, and he could see that we were well below other departments in this category. This year when our budget came up there were no questions asked. This, I am sure, was due primarily to the chart we had prepared for the budget analyst.

We also had worked out the definition of a work unit and, giving definite weight to each activity, got a comprehensible definition of a work unit, and then we used that for administrative purposes. This too has been very helpful from the standpoint of budget.

MR. LEVY: We work under a work quota originally determined by the department based on the past efforts of the department and an our annual reports. We find this very good in that it gives us targets to aim for.

MR. RHEIN: We work on an accomplishment budget which includes two sections, basic and supplemental. The basic compares our activity load and costs for 3 years, and the estimation for the next year. Then there is a supplemental budget under which we set up what we anticipate we must have to further our work. This includes equipment and other expenditures. We do not set a pattern that a man has to do so many scales or so much of this or that a day, but we do show so many man hours a year spent on various activities and the number of activities covered in that year.

MR. M. L. RICE: For the past 3 years we have been operating on a performance budget. At the beginning, we had to establish units of control which were units of inspection. These included package checking as well as various device testing, and were based on the time consumed in each of the various inspections. When our budget in dollars and cents is established, we are required to establish units of inspection based on the anticipated workload. These are broken

down on a quarterly basis—that is, expenditures that will be needed for each quarter to cover the units of inspection. After our work is finished each quarter, it is required that we submit a report, and, if the actual performance is greater or less than the estimate, we must explain why.

MR. HANSEN: I have had a good deal of experience along the line of budgets. I have been very lucky. I have had to appear before the Legislature many times. Although there have been some budget people who have tried to get particular about the number of pieces, etc., the Legislature itself has never asked me a single question about whether we could do more work for the number of men we have, or anything in that regard. They seem to be concerned chiefly with how well the work is done. There was a period of about 12 years that supervisors tried to vie with what had been done before, and they tried to do more testing with less money and less travel expense and less men, but we changed that entirely and put the men on their honor to try to do a good day's work, and the results have proved very beneficial.

I might say that, during the period of "competition" among supervisors, the total appropriations were never increased. Since then, our appropriations have been increased from \$30,000 to \$250,000 a year.

(At the conclusion of the Open Forum Discussion, a motion was made by Mr. Jackson to "have the Executive Committee of the Conference direct a study, devise a plan for the exchange of information on a national basis, put any such phase of this plan into operation, and report on this plan during the next National Conference in 1958." The motion was adopted by the Conference.)

REMARKS OF R. A. FINDLAY, DEPUTY INSPECTOR OF WEIGHTS AND MEASURES, DEPARTMENT OF TERRITORIAL POLICE, JUNEAU, ALASKA

The Alaska weights and measures activity has been in existence since 1939, although it was really just on paper until 1953, when it was transferred to the Treasury Department and then to the Tax Department. In 1955, the Legislature transferred the division to the Territorial Police, of which I am a member. I hold a commission as Captain in the Territorial Police, assigned to weights and measures as the deputy inspector. At the present time I am the only weights and measures inspector in the Territory, so naturally I cannot cover the entire Territory. I do the best I can by concentrating on the larger cities instead of skipping around here and there where weights and measures enforcement is not quite as necessary.

When I took office a little over a year ago, Mr. Brandt, the Superintendent of Police, instructed me to write a new weights and measures code and have an up-to-date system of inspections throughout the Territory. It was quite a job. I wrote to several officials in the States, whom I knew, for advice and published material. After studying considerable material and selecting that which was appropriate for our operation, I sent it to the Legislature and appeared before several committees.

I think we have come up with a pretty good code. We have the package-marking law, and we have the gasoline-control law, which prohibits mixing different types of fuels. Report of the sale or repair of equipment is another item we included. It seems that a lot of

salesmen would come into the Territory during the summer months, sell a piece of equipment, and that was the end of it. Neither salesman nor owner would know whether the scale was operating effectively. We put in a law that requires all salesmen to notify the Division of Weights and Measures every time they sell or install a piece of equipment in the Territory. In that way, it is up to us to inspect it when we are in that locality.

We tried to put through Handbook 44. It did pass the Senate without dissent and got to the House floor, and someone got up and said, "We don't want to adopt anything by reference," and it was defeated. However, I was up in the gallery and immediately started waving the handbook until I got recognized. After my talk they consented to a second reading. This was amended to say, "In addition thereto, the inspector is authorized and empowered to adopt and promulgate rules and regulations pertaining to specifications and tolerances for commercial weights and measures and weighing and measuring devices." This pleased me, as it gives us the necessary power.

We found that education was very much needed in our Territory. I have been on the radio three or four times. We get free time, and I have explained the requirements on packaging, etc., to educate the people. I have been on TV once. I have used the newspapers and magazines and have gone before the Women's Clubs and organizations of that kind to discuss weights and measures. You would be surprised what good you can get out of that, and I heartily endorse it. You get 100 percent cooperation.

Budgetwise, we started out with a \$500 appropriation in 1939, which you can understand, did not go very far. In 1953 the Division received \$15,000 for a 2-year operation. This was an improvement, but it only lasted for about 1 year. In the 1957 Legislature we increased that appropriation to \$35,200. We had asked for \$60,000, but we are somewhat satisfied, as the amount we received represents some increase.

The \$60,000 was mainly required for an additional inspector, but the Legislature at this time did not feel justified in allowing it. However, I am sure we can still manage to do a fairly good job in the Territory.

We have ample equipment. We have purchased additional test weights to increase our total to about 5,000 pounds. We have ordered and received six additional 30-pound test kits, seven 5-gallon provers, and have on order a truck with a 100-gallon calibrated tank. We need all of this equipment, as you can readily understand that it is impracticable to carry 50-pound test weights on an airplane going from one section to another.

We do a lot of flying in the southwest part of Alaska. I probably travel 25,000 miles a year by plane. In the outposts I use a patrol car. I have even gone in on a dog team.

I think that progress is definitely being made. We have one term we use in Alaska, and you have heard it in dog-team work. They say "Mush" which means "Forward," "Gee" which means "To the right," and "Haw" which means "To the left." I can assure you, gentlemen, that Alaska is going to "Mush" in the future.

REPORT OF THE TREASURER

JUNE 1, 1957

Balance on hand May 1, 1956-----	\$1,889.81
RECEIPTS:	
May 25—	
Registration fees—1956 Conference, 387 at \$5.00—	\$1,935.00
Interest accrued-----	15.30

Total -----	1,950.30

DISBURSEMENTS:	
May 22-25, 1956—	
Expenses of 41st National Conference-----	1,437.46
May 15, 1956—	
Conference Stationery-----	55.90
May 31, 1956—	
Honor Award Certificates-----	49.17

Total -----	1,542.53

Balance on hand June 1, 1957-----	\$2,297.58

(Signed) GEORGE F. AUSTIN, JR.,
Treasurer.

(The report of the Treasurer was adopted by the Conference.)
(The Forty-second National Conference on Weights and Measures adjourned
sine die at 12 p. m.)

PERSONS ATTENDING THE CONFERENCE

Delegates—State, City, and County Officials

ALASKA

Territory----- ROBERT A. FINDLAY, Inspector, Division of Weights and Measures, Department of Territorial Police, Juneau, Alaska.

ARIZONA

State----- DICK FRANK, State Inspector, Department of Weights and Measures, State Office Building, Phoenix, Arizona.

CALIFORNIA

State----- JAMES E. BRENTON, Chief, Bureau of Weights and Measures, Department of Agriculture, 1220 "N" Street, Sacramento.

County
Alameda----- WILLIAM A. KERLIN, County Sealer of Weights and Measures, 333 Fifth Street, Oakland.
Los Angeles----- CHARLES MORRIS FULLER, County Sealer of Weights and Measures, 3200 N. Main Street, Los Angeles.
San Diego----- HERBERT J. McDADE, County Sealer of Weights and Measures, 1480 F Street, San Diego.

COLORADO

State----- HARRY N. DUFF, Supervisor, Weights and Measures Section, Division of Markets, Department of Agriculture, 3130 Zuni Street, Denver.
HARVEY H. HOUSTON, Director, Oil Inspection Department, 1024 Speer Boulevard, Denver.

CONNECTICUT

State----- ATTILIO R. FRASSINELLI, Commissioner, Food and Drug Commission, State Office Building, Hartford.
FRANK M. GREENE, Chief, Division of Weights and Measures.
FRANK J. DELANEY, State Inspector of Weights and Measures, 1217 Windsor Avenue, Windsor.

County:
Fairfield----- WILLIAM E. SHEEHY, JR., County Sealer of Weights and Measures, County Court Building, Bridgeport.
ALVIN COGER, Assistant County Sealer.
ERNEST WILSON, Assistant County Sealer.
Hartford----- RAYMOND J. MARCOTTE, County Sealer of Weights and Measures, County Court Building, 95 Washington Street, Hartford.
VINCENT J. ARGENTO, Assistant County Sealer.
HENRY J. ROJESKI, Assistant County Sealer.
Tolland----- WILLIAM F. MASINDA, County Sealer of Weights and Measures, West Willington.

City:
Bridgeport----- MAX FRANKEL, City Sealer of Weights and Measures, 925 Main Street.
Hartford----- NATHAN KALECHMAN, City Sealer of Weights and Measures, City Hall.
New Britain----- ARMAND J. ALBANESE, City Sealer of Weights and Measures, Municipal Building.

DELAWARE

State----- JOHN L. CLOUGH, Acting Secretary, State Board of Agriculture, Dover.
RALPH W. WINE, Director, Bureau of Markets.

DISTRICT OF COLUMBIA

Weights, Measures, and Markets Branch, Department of Licenses and Inspection, Room 131 District Building, Fourteenth and E Streets, N. W., Washington, D. C.

District----- J. THOMAS KENNEDY, Chief.
J. M. BOUCHER, Supervisor.
R. A. MONTGOMERY, Supervisor.
HOWARD BALACEK, Inspector and Investigator.
J. T. BENNICK, Inspector and Investigator.
W. R. CORNELIUS, Inspector and Investigator.
F. C. HARBOUR, Inspector and Investigator.
KENNETH HAYDEN, Inspector and Investigator.
H. P. HUTCHINSON, Inspector and Investigator.
W. H. JENNINGS, Inspector and Investigator.
G. P. KOMOS, Inspector and Investigator.
T. B. MIDDLETON, Inspector and Investigator.
I. L. WAGNER, JR., Inspector and Investigator.
F. M. WARNER, Inspector and Investigator.
W. W. WELLS, Inspector and Investigator.

FLORIDA

State----- NALLS BERRYMAN, Director, Weights and Measures Division, Department of Agriculture, Nathan Mayo Building, Tallahassee.

City :
Jacksonville----- HOWARD E. CRAWFORD, Inspector of Weights and Measures, 431 West Eighth Street.
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State----- PAUL I. MORRIS, JR., Chief, Weights and Measure Section, Department of Agriculture, 19 Hunter Street, S. W., Atlanta.
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ILLINOIS

State----- MERRILL M. EMERICK, Assistant Superintendent, Division of Foods, Dairies, and Standards, Emmerson Building, State Fairgrounds, Springfield.
City : Chicago----- IRVINE M. LEVY, City Sealer of Weights and Measures, 321 N. Clark Street.

INDIANA

State----- ROLLIN E. MEEK, Director, Division of Weights and Measures, State Board of Health, 1330 W. Michigan Street, Indianapolis.

County :
Grant----- REUBEN C. PARKS, Inspector of Weights and Measures, Court House, Marion.
Howard----- IVAN R. FRAZER, County Inspector of Weights and Measures, 720 E. Boulevard, Kokomo.
St. Joseph----- STEPHEN C. GRZESKOWIAK, County Inspector of Weights and Measures, Court House, South Bend.
Vigo----- ROBERT J. SILCOCK, County Inspector of Weights and Measures, Court House, Terre Haute.

City :
Ft. Wayne----- JAMES A. HILGEMANN, City Inspector of Weights and Measures, 301 South Clinton Street.
Gary----- CLEO C. MORGAN, City Sealer of Weights and Measures, City Hall.
South Bend----- BERT S. CICHOWICZ, City Inspector of Weights and Measures, City Hall.
Terre Haute----- JOHN T. HARPER, City Inspector of Weights and Measures, City Hall.

IOWA

State----- CLYDE SPRY, Secretary, Department of Agriculture, Capitol Building, Des Moines.

KANSAS

State----- J. FRED TRUE, State Sealer, Weights and Measures Division, State Board of Agriculture, State Office Building, Topeka.
JOHN L. O'NEILL, Deputy Sealer, Williamsburg.

KENTUCKY

State----- GEORGE L. JOHNSON, Director, Division of Weights and Measures, Department of Agriculture, Capitol Annex, Frankfort.

LOUISIANA

State----- F. F. THOMPSON, Chief Chemist, Petroleum Products, Department of Revenue, P. O. Box 8374, University Station, Baton Rouge.

MAINE

State----- HARLON D. ROBINSON, Deputy State Sealer of Weights and Measures, Department of Agriculture, Capitol Building, Augusta.

City : Portland----- CHARLES J. WILLS, JR., Sealer of Weights and Measures, City Building, 389 Congress Street.

MARYLAND

State----- JOHN E. MAHONEY, Superintendent of Weights and Measures, Department of Markets, State Board of Agriculture, University of Maryland, College Park.
RICHARD N. SMITH, Assistant Superintendent.

County :
Baltimore----- FRANK J. VITTEK, Chief Inspector of Weights and Measures, County Office Building, Towson.
GEORGE J. KLEIN, Assistant Inspector.

Montgomery----- E. W. BUCKLIN, Director, Department of Inspection and Licenses, County Office Building, Rockville.
LYNWOOD B. MORTON, Weights and Measures Inspector.

Prince George's----- ROBERT J. CORD, County Sealer of Weights and Measures, County Court House, Upper Marlboro.

City : Baltimore----- GEORGE H. LEITHAUSER, Chief Inspector, Division of Weights and Measures, Municipal Building.
EDWIN EDWARD JAFFA, Inspector.

MASSACHUSETTS

State----- JOHN P. McBRIDE, Director of Standards and Necessaries of Life, Department of Labor and Industries, 194 State House, Boston.

City :
Boston----- JOHN F. McCARTHY, Sealer of Weights and Measures, City Hall Annex.
Brookline----- NORMAN A. SACKNOFF, Deputy Sealer of Weights and Measures, Town Hall.

Cambridge----- ANDERS T. ANDERSON, Sealer of Weights and Measures, Municipal Building.
 Everett----- LAWRENCE L. ELLIOTT, Sealer of Weights and Measures, City Hall.
 Newton----- J. ELLIS BOWEN, Sealer of Weights and Measures, City Hall, Newton Center.
 Northbridge----- CAMILLE R. GUERTIN, Sealer of Weights and Measures, Linwood.
 Quincy----- HENRY H. HUGHES, Sealer of Weights and Measures, 63 Saville Row.
 Salem----- BRUCE A. KOTULAK, Sealer of Weights and Measures, 174 Bridge Street.

MICHIGAN

State----- MILES A. NELSON, Chief, Foods and Standards Division, Department of Agriculture, Lewis Cass Building, Lansing.
 CLYDE O. COTTON, Supervising Inspector of Weights and Measures.
 LEO J. BAUER, State Inspector.
 ROGER R. BURCH, State Inspector.
 LEE K. RICE, State Inspector, 106 N. Emmons, St. Johns.
 REX J. TUTTLE, State Inspector, 321 East Street South, Morenci.
 MARGARET TREANOR, Secretary, Bureau of Foods and Standards, State Department of Agriculture, Lewis Cass Building, Lansing.
 City:
 Dearborn----- PETER W. VERMULLEN, Superintendent, Department of Licenses, Weights, and Measures, 13030 Hemlock Avenue.
 JAMES J. LAWLER, Inspector.
 Detroit----- GEORGE F. AUSTIN, Jr., Sealer of Weights and Measures, 740 Elmwood Avenue.
 Highland Park----- JAMES F. BAKER, City Sealer of Weights and Measures, Police Department.
 Lansing----- WALTER M. SAXTON, City Sealer of Weights and Measures, City Market.
 Pontiac----- WALTER A. BAERWOLF, City Sealer of Weights and Measures, 8 N. Perry Street.

MINNESOTA

State----- ERLING HANSEN, Supervisor, Department of Weights and Measures, Railroad and Warehouse Commission, One Flour Exchange, Minneapolis.
 OTTO K. WARNLOF, State Inspector.
 City: Minneapolis----- JOHN G. GUSTAFSON, Superintendent, Department of Licenses, Weights, and Measures, City Hall.

MISSISSIPPI

State----- W. G. SELLERS, State Sealer of Weights and Measures, Laurel-R #1.

MISSOURI

City: St. Louis----- JOSEPH R. BERNARD, Commissioner of Weights and Measures, City Hall.

NEVADA

State----- E. L. RANDALL, State Sealer, Department of Weights and Measures, Public Service Division, University of Nevada, P. O. Box 719, Reno.

NEW HAMPSHIRE

State----- FREDERICK YOUNG, State Inspector of Weights and Measures, 204 Gilford Street, Manchester.

City :	
Laconia	CHARLES J. GOSS, City Sealer of Weights and Measures, 109 Belvidere Street, Lakeport.
Manchester	FERNAND A. GENEST, City Sealer of Weights and Measures, 180 Franklin Street.
Portsmouth	WILLIAM A. THOMSON, City Sealer of Weights and Measures, 56 Ridges Court.

NEW JERSEY

State	SAMUEL H. CHRISTIE, JR., Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, 187 W. Hanover Street, Trenton.
County :	ARCHIE T. SMITH, Assistant State Superintendent.
Atlantic	JAMES E. MYERS, County Superintendent of Weights and Measures, 350 S. Egg Harbor Road, Hammonton.
Bergen	MICHAEL J. SANTIMAURO, County Superintendent of Weights and Measures, 66 Zabriskie Street, Hackensack.
Burlington	ERNEST EDWIN DAWSON, Assistant Superintendent.
Camden	PAUL F. NUNN, County Superintendent of Weights and Measures, 236 Hooker Street, Riverside.
Cumberland	DAVID F. HUMMEL, Assistant Superintendent.
Essex	ALBERT C. BECKER, County Superintendent of Weights and Measures, City Hall, Camden.
Gloucester	ALFRED LIRIO, County Superintendent of Weights and Measures, P. O. Box 369, Vineland.
Mercer	WILLIAM H. SCHNEIDEWIND, County Superintendent of Weights and Measures, Hall of Records, Newark.
Monmouth	MARTIN J. CAULFIELD, County Superintendent of Weights and Measures, Westville Road, Almonesson.
Passaic	RALPH M. BODENWEISER, County Superintendent of Weights and Measures, Court House, Trenton.
Union	JOHN A. J. BOVIE, Assistant County Superintendent of Weights and Measures, 82 W. Wall Street, Neptune City.
Warren	WILLIAM I. THOMPSON, Assistant County Superintendent of Weights and Measures, Lake and Grassmere Avenue, Wanamassa.
	WILLIAM G. DOX, County Inspector of Weights and Measures, 12 Campview Pl., Keansburg.
City :	WILLIAM MILLER, County Superintendent of Weights and Measures, Administration Building, Paterson.
Englewood	JAMES M. DIETZ, County Superintendent of Weights and Measures, Court House, Elizabeth.
Fair Lawn	GERALD E. CONNOLY, County Superintendent of Weights and Measures, Court House, Belvidere.
Garfield	LEONARD DERIENZO, Municipal Superintendent of Weights and Measures, City Hall.
Jersey City	ALPHONSE J. BEGYN, Superintendent of Weights and Measures, Plaza Building.
Linden	CHARLES BENANTI, Municipal Superintendent of Weights and Measures, Police Building, Somerset Street.
Passaic	HAROLD J. MYERS, Acting Superintendent of Weights and Measures, City Hall.
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Trenton	PAUL DEVRIES, Municipal Superintendent of Weights and Measures, Municipal Building.
	JOSEPH SHAW, Assistant Superintendent.
	J. P. LEONARD, Superintendent of Weights and Measures, 115 Van Houten Street.
	WILLIAM J. KEHOE, JR., Assistant Superintendent.
	FRANK J. BLACK, Superintendent of Weights and Measures, Court House.

NEW YORK

State-----	DANIEL J. CAREY, Commissioner, Department of Agriculture and Markets, Albany.
	JOHN J. LEONARD, Director, Bureau of Weights and Measures, Department of Agriculture and Markets, State Office Building, Albany.
County :	
Genesee-----	GLENN A. PULLMAN, County Sealer of Weights and Measures, 19 Buffalo Street, Bergen.
Monroe-----	EARL D. HUBLE, County Sealer of Weights and Measures, 1400 South Avenue, Room B, Rochester.
Nassau-----	ROBERT WILLIAMS, County Sealer of Weights and Measures, Old County Court House Annex, Mineola.
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	HUDSON H. WRIGHT, County Sealer of Weights and Measures, 30 Catherine Street, Lyons.
City :	
Binghamton-----	HARRY A. LASON, City Sealer of Weights and Measures, 60 Robinson Street.
Lackawanna-----	JOHN J. SERES, City Sealer of Weights and Measures, 84 Rosary Avenue.
Niagara Falls-----	T. J. PAONESSA, Assistant City Sealer of Weights and Measures, Public Service Building, Walnut Avenue and 6th Street.
Rochester-----	A. C. SAMENFINK, City Sealer of Weights and Measures, Rochester Public Market, Administration Building.
Schenectady-----	ASHLEY C. GLOVER, City Sealer of Weights and Measures, City Hall.
Yonkers-----	JOHN DIMASE, City Sealer of Weights and Measures, City Hall.

NORTH CAROLINA

State-----	C. D. BAUCOM, Superintendent, Weights and Measures Division, Department of Agriculture, Agriculture Building, Raleigh.
	JOHN I. MOORE, Field Supervisor.
	RAYMOND W. BURNETTE, State Inspector.
	GORDON S. YOUNG, State Inspector.
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NORTH DAKOTA

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OHIO

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County :	
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City :	
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OKLAHOMA

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PENNSYLVANIA

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County :
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City :
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Erie----- PAUL F. WATSON, City Inspector of Weights and Measures, City Hall.
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TEXAS

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VIRGINIA

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City : Alexandria----- CLIFFORD B. TATE, Sealer of Weights and Measures, City Hall.
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WASHINGTON

City : Seattle----- DON M. TURNBULL, Supervisor, Licenses and Standards, Office of the Comptroller, County-City Building.

WEST VIRGINIA

County : Harrison----- BEATRICE LANHAM, County Sealer of Weights and Measures, Bristol.

WISCONSIN

State----- CLAIRE L. JACKSON, Chief, Division of Economic Practices, Department of Agriculture, State Capitol, Madison.
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City :
Green Bay----- NORRIS P. TILLEMAN, Sealer of Weights and Measures, City Hall.
Kenosha----- JOSEPH P. KUCHERA, Sealer of Weights and Measures, City Hall.
Milwaukee----- LOUIS E. WITT, Sealer of Weights and Measures, 1331 N. 5th Street.
Sheboygan----- J. A. PEIKERT, Sealer of Weights and Measures, City Hall.
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- R. D. THOMPSON, Supervisor of Scales and Weighing, Packers and Stockyards Branch, Livestock Division, Agricultural Marketing Service.
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- C. R. ADAIR, Agronomist, Field Crops Research Branch, Agricultural Research Service, Beltsville, Maryland.
- J. R. SCOTT, Chief, Trade Label Section, Meat Inspection Branch, Agricultural Research Service.

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- WALTER WILLIAMS, Under Secretary of Commerce.

U. S. Department of Health, Education, and Welfare :

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- M. R. STEPHENS, Director, Bureau of Enforcement, Food and Drug Administration.
- JAMES C. PEARSON, Director, Division of Federal-State Relations, Food and Drug Administration.
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U. S. Treasury Department:

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W. V. STOCKTON, Jr., Product Manager, 13500 Philmont Ave., Philadelphia,
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American Scale and Vise Company: C. V. MARKS, Chief Engineer, 2745 South-
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Bastian and Blessing Company: HAROLD NORWAY, 4201 W. Peterson Avenue,
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Beck and Company, Limited: H. G. SOAR, Chief Designer, Streatham Vale, Lon-
don, S. W., 16, England.

Bloomer Brothers Company: RAYNOR M. HOLMES, Research Engineer, Newark,
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Bowlin, J. P., Company: LUTHER E. HARRIS, General Manager, 2913-15 Bledsoe,
Fort Worth, Texas.

Bowser, Inc.:

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E. J. REINHART, Service Manager.

RICHARD J. RYAN, Washington Representative, 5605 Northfield Road,
Bethesda, Md.

Brodie, Ralph N., Company, Inc.:

C. J. McCAFFREY, Vice President, 550 South Columbus Avenue, Mount Ver-
non, N. Y.

D. W. KINGSLY, Eastern Sales Manager.

HOWARD E. SIEBOLD, Sales Engineer, 529 Chrysler Building, New York, N. Y.

Chatillon, John, and Sons:

GEORGE C. REILEY, Vice President, 85 to 93 Cliff Street, New York 38, New
York.

SIDNEY AGLOW, Sales Representative.

Continental Can Company, Inc.: THOMAS P. McGLYNN, Sales Manager—Product
Development, 349 Oratton Street, Newark, N. J.

Cox and Stevens Electronic Scales, Division of Revere Corporation of America:
W. K. DAVIES, General Sales Manager, 630 Fifth Avenue, New York 20, N. Y.

C. W. SILVER, Division Sales Manager, Wallingford, Connecticut.

HOWARD L. ZUPP, Field Engineer, 3525 Guilford Avenue, N. W., Canton, Ohio.

Dairy Equipment Company: K. S. HART, Vice President, 1444 E. Washington
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Detco Scales, Inc.:

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N. Y.

MACK RAPP, Vice President.

MRS. CARRIE G. WOODLAND, Representative, 539 Edwards Drive, The Uplands,
Sarasota, Florida.

Dixie Cup Company:

ARTHUR J. NOLAN, Vice President, Easton, Pennsylvania.

CLEMENT G. McBRIDE, Assistant to the President.

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Downington Iron Works, Inc.: W. F. KEEHN, Manager, Product Development,
Downington, Pennsylvania.

Erie Meter Systems, Inc.: PAUL R. FISHBURN, Chief Engineer, Erie, Pennsyl-
vania.

Exact Weight Scale Company:

W. A. SCHEURER, President, 538 East Town St., Columbus, Ohio.

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OLIVER H. WATSON, Chicago Division Manager, 608 South Dearborn Street,
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Factory Equipment Company: JOHN F. FEIND, President, 190 State Street,
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Fairbanks, Morse and Company:

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JEROME C. KENNEY, Field Engineer, 731 Charing Cross Road, Baltimore 29, Maryland.

W. J. RUEZER, Field Engineer, 659 E. 25th Street, Baltimore 29, Maryland.

Fisher Governor Company: W. H. HOAGLAND, Eastern Manager, Spec. Controls Division, 212 East State Street, Westport, Connecticut.

Fuller, H. J., Company:

H. J. FULLER, President, 1371 West Third Avenue, Columbus 12, Ohio.

WILLIAM S. FULLER, Sales Manager.

Gilbert and Barker Manufacturing Company: WILLIAM KEAY, Manager, Sales Service, West Springfield, Massachusetts.

Granberg Corporation:

J. R. MURPHEY, Sales Manager, 1308-67th Street, Oakland, California.

WILSON M. MILLIGAN, Eastern Division Sales Manager, 489 Fifth Avenue, New York.

Gurley, W. & L. E.: F. G. WILLIAMS, Washington Representative, 5514 Nevada Avenue, N. W., Washington, D. C.

Hobart Manufacturing Company:

KENNETH C. ALLEN, Director of Scale Operations, 448 Huffman Avenue, Dayton 3, Ohio.

E. A. REUSSENZEHN, Chief Scale Engineer.

MURRAY W. CRAIG, Weights and Measures Representative, Pennsylvania Avenue at Simpson Street, Troy, Ohio.

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Howe Scale Company:

RICHARD F. STRAW, Vice President, 2941 Scale Avenue, Rutland, Vermont.

FRANK E. PRINGLE, Assistant General Sales Manager.

GEORGE D. WILKINSON, National Service Manager.

CLYDE K. BROOKS, Jr., Factory Representative, 3008 W. Marshall Street, Richmond, Virginia.

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JOHN B. WEAVER, Salesman, 1208 East Morehead, Charlotte 3, North Carolina.

Hunter, S. S., Inc.: WILLIAM M. SHANHOUSE, General Manager, Syosset, New York.

Lily-Tulip Cup Corporation:

RICHARD S. WECHSLER, Counsel, 122 East 42d Street, New York 17, New York.

MILIO WILDER.

Martin-Decker Corporation: ALAN G. HERRICK, Sales Manager, 3431 Cherry Avenue, Long Beach 7, California.

Marvel Rack Manufacturing Company, Inc.: CHARLES W. McCARTHY,* President, 24 North First Street, Minneapolis 1, Minnesota.

McIntyre, John J., Sons:

F. L. MCINTYRE, Owner, 514 Knorr Street, Philadelphia, Pennsylvania.

JOHN L. MCINTYRE, Sales and Service.

Measuregraph Company:

C. H. ANGLE, Eastern Regional Manager, 771 South Woodington, Baltimore 29, Md.

FLOYD L. WALL, Representative, 300 Baltimore Road, Rockville, Maryland.

Murphy, L. R., Scale Company: L. R. MURPHY, President, 1610 North C Street, Sacramento 14, California.

Neptune Meter Company:

EMMETT F. WEHMANN, Chief Development Engineer, 22-42 Jackson Avenue, Long Island City 1, New York.

JOSEPH J. DELFAUSSE, Chief Engineer.

RUSSELL W. WETJEN, Sales Manager, 19 W. 50th Street, New York 20, New York.

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Nicol Scales Company:

WILLIAM F. NICOL, Owner, 1315 South Akard Street, Dallas, Texas.

MRS. NOREEN NICOL, Co-owner.

*Registered in absentia.

Palmer Torsion Balance Company: DAVID PALMER, General Manager, 1186 Broadway, New York 1, New York.

Penn Scale Manufacturing Company, Inc.: SYDNEY BLACK, President, 150 West Berks Street, Philadelphia 22, Pennsylvania.

Pennsylvania Scale Company: J. H. LANDVATER, President, Bareville, Pennsylvania.

Richardson Scale Company:

- INGRAM H. RICHARDSON, President, 668 Van Houten Avenue, Clifton, New Jersey.
- ARTHUR J. BURKE, Vice President.
- Charles S. GRAHAM, Service Manager.

Rockwell Manufacturing Company:

- EDWARD R. EYLER, Sales Engineer, Central Engineering Department, 400 N. Lexington Avenue, Pittsburgh 8, Pennsylvania.
- ALBERD J. KOMICH, Product Manager—Liquid Meters.

Seraphin Test Measure Company: THEO. A. SERAPHIN, President, 1314 North 7th Street, Philadelphia, Pennsylvania.

Shanner Equipment Co.: JACK W. POLIVKA, Vice President, 8923 Ogden Ave., Brookfield, Illinois.

Smith, A. O., Corporation:

- H. D. LEISENRING, General Sales Manager, 250 Park Avenue, New York 17, N. Y.
- WILLIAM E. STEEN, Chief Engineer, Meter Products, 5715 Smithway Street Los Angeles 22, California.

Spinks Scale Company: J. M. SPINKS, President, 836 Stewart Avenue, S. W., Atlanta 10, Ga.

Streeter-Amet Company: ROBERT T. ISHAM, Vice President, Grayslake, Illinois.

Texoil Equipment, Inc.: JOHN H. GRINNELL, Manager, LPG Department, 1816 Cockrell, Dallas 15, Texas.

Thatcher Glass Manufacturing Company:

- JAMES ARRANDALE, Quality Control Consultant, 623 W. Water Street, Elmhira, N. Y.
- ALFRED C. THOMAS.

Tokheim Corporation: WILLIAM LOUTHAN, Manager, Field Service, 1600 Wabash Avenue, Fort Wayne 1, Indiana.

Toledo Scale Company:

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- H. WARREN HEM, Senior Engineer.
- WALLACE M. EVANS, Custom Industrial Specialist.
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U. S. Slicing Machine Company: MATT RIBBLE, Special Representative, 186 Glen-dale Avenue, Highland Park 3, Michigan.

Veeder-Root, Inc.:

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- H. W. BARNES, Assistant Sales Manager—Computer Department.

Washington Scale and Equipment Company, Inc.: AARON YOCHELSON, President, 1107 New Jersey Avenue, N. W., Washington 1, D. C.

Wayne Pump Company:

- C. F. BATEMAN, Vice President, Salisbury, Maryland.
- FREEDOM H. AINSWORTH, Chief Engineer.
- WILLIAM O. HOWLAND, Engineer.
- FRANK W. LOVE, Engineering Department.
- THOMAS F. BREEN, Service Manager.

Weatherhead Company: JOHN D. SELIM, Development Coordinator, 300 East 131st Street, Cleveland 8, Ohio.

Wood, John, Company:

- L. G. CLOSE, Manager, Mid-Atlantic States, 2127 N. Charles Street, Baltimore 18, Maryland.
- W. M. HOXIE, Service Manager, Bennett Pump Division, Broadway and Lethen Street, Muskegon, Michigan.

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American Seed Trade Association: DELOS L. JAMES, Representative, 725 15th Street, N. W., Washington 5, D. C.

American Standards Association: A. C. HUTTON, Washington Representative, 4705 Industrial Building, National Bureau of Standards, Washington 25, D. C.

Association of American Railroads: D. UNDERWOOD, Grain Specialist, 59 E. Van Buren Street, Chicago 5, Illinois.

Atlantic & Pacific Tea Company: NORMAN E. DUKES, Weights and Measures Department, 881 Memorial Drive, S. E., Atlanta, Georgia.

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Cooperative League of USA: JACK T. JENNINGS, Assistant Director, Washington Office, 1025 Vermont Avenue, N. W., Washington 5, D. C.

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Esso Standard Oil Company: L. L. KENNEDY, Superintendent, Construction and Maintenance, 500 N. Broad Street, Elizabeth, New Jersey.

Fuelane Corporation: CHARLES C. TURNER, Director, Special Services, Liberty, N. Y.

Gasoline Pump Manufacturers Association: G. THEON WRIGHT, Managing Director, 420 Lexington Avenue, New York 17, New York.

General Foods Corporation: CHARLES A. CLARK, Weights and Measures Coordinator, 250 North Street, White Plains, New York.

General Mills, Inc.: OSWALD A. OUDAL, Products Control Manager, 400—2nd Avenue, South, Minneapolis 1, Minnesota.

Glass Container Manufacturers Institute, Inc.: C. E. WAGNER, Development Engineer, 99 Park Avenue, New York 16, New York.

Greenbelt Consumers Services: CHARLES B. MYERS, Greenbelt, Maryland.

Gulf Oil Corporation: E. C. DICKEY, Superintendent, Marketing Equipment, Atlanta Sales, Post Office Box 6145, Station "H", Atlanta, Georgia.

Liquefied Petroleum Gas Association, Inc.: ARTHUR C. KREUTZER, Vice President and Counsel, 11 S. La Salle Street, Chicago, Illinois.

Marvadel Ice Cream Company, Inc.: JOHN C. KRUSEN, Manager, 4001 Seven Mile Lane, Baltimore 8, Maryland.

Milk Industry Foundation: ERNEST KELLOGG, Secretary, 1145—19th Street, N. W., Washington, D. C.

Miller, Byron, and Associates:
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National Fisheries Institute, Inc.:
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HARRIS W. MAGNUSSON, Technology Division Director.

National Tank Truck Carriers, Inc.: LOUIS REZNEK, Director of Engineering and Safety, 1424—16th Street, N. W., Washington 6, D. C.

Oyster Institute of North America :

FRANK M. MILES, Director, Box 178, Norfolk, Virginia.

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Paper Can Association: ARTHUR W. HOWE, JR., Assistant to Executive Secretary, 1532 Philadelphia National Bank Building, Philadelphia 7, Pennsylvania.

Paper Cup and Container Institute, Inc.: ROBERT W. FOSTER, Assistant to Executive Director, 250 Park Avenue, New York, N. Y.

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Phillips Petroleum Company: PAUL W. TUCKER, Technical Representative, Bartlesville, Oklahoma.

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Pure Oil Company: R. G. EMMETT, Assistant Operations Manager, 35 E. Wacker Drive, Chicago 1, Illinois.

Pyrofax Gas Corporation: W. H. SCOTT, Engineer, 295 Madison Avenue, New York 17, New York.

Reading Railroad Company: R. C. THRAN, Scale Inspector, Locomotive Shop, Reading, Pa.

Republic Steel Corporation: DALE R. SMITH, Corporation Weighing Inspector, Oberlin Road, S. W., Massillon, Ohio.

Safeway Stores, Inc.: GIBSON I. WRIGHT, Public Relations Manager, 1845—4th Street, N. E., Washington, D. C.

Saybolt, J. W., Business Counsellor on Weights and Measures Laws, 9209 Carlyle Avenue, Surfside, Miami Beach, Florida.

Scale Journal Publishing Company: MARK W. PICKELL, Editor, 176 West Adams Street, Chicago 3, Illinois.

Scale Manufacturers Association: ARTHUR SANDERS, Executive Secretary, No. 1 Thomas Circle, Washington 5, D. C.

Shell Development Company: BORIS A. FROLOV, Technical Representative, 50 West 50th Street, New York 20, New York.

Shell Oil Company:

MAURICE L. BARRETT, Jr., Senior Engineer, 8500 N. Michigan Road, Indianapolis 8, Indiana.

M. H. DEUTZMAN, Engineer, Structural Division, 50 West 50th Street, New York 20, New York.

FRED LARSON, Project Engineer.

R. W. HIRSCH, Senior Technologist, E&P-Gas.

Sinclair Refining Company: K. W. BIRKIN, Manager, Automotive Department, 600 Fifth Avenue, New York 20, New York.

Skelly Oil Company: ROBERT R. WELLINGTON, Assistant Engineer, Skelly Building, 605 West 47th Street, Kansas City 41, Missouri.

Socony Mobil Oil Company: L. E. REED, Manager, Motor Vehicles, 150 E. 42nd Street, New York 17, New York.

Southern Railway Company: WALTER F. KOHL, Superintendent, Scales and Highway Equipment, Post Office Box 1808, Washington 13, D. C.

Suburban Propane Gas Corporation: C. R. DIETRICK, Project Engineer, Post Office Box 206, Whippny, New Jersey.

Suburban Rulane Gas Company: JOHN MACINTOSH, Post Office Box 29, Charlotte, North Carolina.

Sun Oil Company: A. H. MARSH, Manager, Materials and Equipment Research Department, 1600 Walnut Street, Philadelphia, Pennsylvania.

Texas Company: R. H. TOLSON, Assistant Manager, Sales Department, 135 E. 42nd Street, New York 17, New York.

Thread Institute:

DAVID SNYDER, Executive Director, 11 West 42nd Street, New York 36, New York.

JAMES B. DUFFY, Member, Legislation Committee (Gardiner Hall, Jr., Thread Company, 48 W. 38th Street, New York, N. Y.)

U. S. Wholesale Grocers' Association: HAROLD O. SMITH, Executive Vice President, 1511 K Street, N. W., Washington 5, D. C.

Visking Corporation:

ELLIOT BAILESTIER, Jr., Assistant to President, 201 Main Street, Hackensack, N. J.

WILLIAM M. SAWERS, Assistant Manager, Division of Special Services, Services, 777-14th Street, N. W., Washington, D. C.

Western Weighing and Inspection Bureau: E. M. CURL, Supervisor, Weight Agreements and Weighing, Room 460, Union Station, 517 West Adams Street, Chicago, Illinois.

Other Guests

ASHBROOK, PAUL R., 734 Jackson Place, N. W., Washington 6, D. C.

GORDON, LELAND J., Director, Weights and Measures Research Center, Denison University, Granville, Ohio.

HADOW, H. JOHN, Scientific Attache, British Embassy, Washington, D. C.

KIRK, WILLIAM, JR., Firemen's Home, Hudson, N. Y.

MACINTOSH, JAMES P., Student Engineer, North Carolina State College, Box 4343, College Station, Raleigh, North Carolina.

MACLEAN, R. W., Director, Standards Division, Department of Trade and Commerce, Ottawa, Canada.

MOORE, JOHN I., JR., 200 W. Aycock Street, Raleigh, North Carolina.

NIE, SIOK TJIJIANG, Laboratory for Testing Materials, 244 Djalanan Raja Timur, Bandung, Indonesia.

POPPY, T. G., Controller of Standards, Standard Weights and Measures Department, Board of Trade, Chapter Street House, 26 Chapter Street, London, S. W. 1, England.

SMITH, EDWIN C., 145 Nassau Road, Huntington, Long Island, New York.

TODD, JOSEPH N., 1417 Longfellow Street, Washington 11, D. C.

There were, in addition, 28 individuals who attended pre-Conference committee meetings, but did not register for the Conference.



